



**Mathematics, Science, and  
Technology Education  
Partnership**

### ***IRG Section III***

## **Relationship Between Exemplary Mathematics Curriculum Materials and the New York State Mathematics Learning Standards**

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## **Overview of the Relationship Between Exemplary Mathematics Curriculum Materials and the New York State Mathematics Learning Standards**

One of the goals of the MSTP Project was to select National Science Foundation (NSF) sponsored middle school mathematics curriculum material in our professional development and curriculum enrichment activities. The primary selection criteria were:

- [1] Curriculum materials must provide relevant real-world applications of mathematics concepts and problem solving techniques;
- [2] Curriculum materials must engage middle school students in active learning;
- [3] Learning outcomes of curriculum materials must match the New York State Learning Standards.

The MSTP Management Team used the above criteria to select the following two sets of curriculum material:

- Connected Math
- Math in Context

In this section of the IRG, we provide a comprehensive outline of how the “Connected Math” learning activities are linked to the New York State Mathematics Learning Standards. Participating teachers were provided with professional development workshops to learn about the design and effective usage of this National Science Foundation sponsored exemplary curriculum material. The publisher of the material provided sample materials for teachers to try out the lessons in their classrooms.

## **Calendar for Scheduling Connected Mathematics Project (CMP) Implementation Materials**

Schools interested in implementing the Connected Mathematics Project (CMP) materials would benefit from a review of the analysis done by the Warner School of Education at the University of Rochester.

See: [http://www.rochester.edu/Warner/warnercenter/nys\\_mappings.html](http://www.rochester.edu/Warner/warnercenter/nys_mappings.html).

The Warner School has mapped CMP curriculum to the NYS mathematics performance indicators. This mapping will be helpful to schools wishing to develop a day-by-day calendar for implementing CMP units.

### **As examples:**

***For Grade 6***, the site recommends Data About Us and Bits II during the first 11 weeks of school (Fall). The site recommends Covering and Surrounding and Bits III for the next 13 weeks (Winter). The site recommends Variables and Patterns and How Likely Is It? for the last 10 weeks of school. (Spring). They have taken into consideration the pre and post March expectations.

***For Grade 7***, the site recommends Stretching and Shrinking during the first 10 weeks of school (Fall). The site recommends What Do You Expect?, Filling and Wrapping, and Data Distributions for the next 11 weeks (Winter). The site recommends Comparing and Scaling and Moving Straight Ahead for the last 11 weeks of school (Spring). They have taken into consideration the pre and post March expectations.

***For Grade 8***, the same type of plan is referenced.



# MSTP Document

## Prepared for MSTP Participants by Linda L. Walker

April, 2006

Grade Six

### *Number Sense and Operations Strand*

**Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.**

6.N.1	Read and write whole numbers to trillions	<u>Supplement</u>
6.N.2	Define and identify the commutative and associative properties of addition and multiplication. <u>Test 2006</u> (Match not verified) Which equation shows the commutative property of addition? a. $6 + 3 = 9$ b. $6 + 3 = 6 + 3$ c. $6 + 3 = 3 + 6$ d. $6 + 3 = 5 + 4$	Supplement while teaching <i>Bits and Pieces II</i>
6.N.3	Define and identify the distributive property of multiplication over addition.	Supplement while teaching <i>Bits and Pieces II</i>
6.N.4	Define and identify the identity and inverse properties of addition and multiplication.	Supplement while teaching <i>Bits and Pieces II</i>
6.N.5	Define and identify the zero property of multiplication. <u>Sample Test 2005</u> Which equation shows the zero property of multiplication? a. $9 \times 0 = 0$ b. $9 \times 0 = 9$ c. $9 \times 0 = 1$ d. $9 \times 1 = 0$	Supplement while teaching <i>Bits and Pieces II</i>
6.N.6	Understand the concept of rate.	CMP <i>Bits and Pieces I</i> , 6.2, 6.3 CMP2 <i>Bits and Pieces I</i> , page 59 "Did You Know"

6.N.7	<p>Express equivalent ratios as a proportion.</p> <p><u>Sample Test 2005</u></p> <p>Betty made <math>\frac{3}{4}</math> of the baskets she attempted in a basketball game. Which other ratio is equivalent to the number of baskets Betty made?</p> <p>(Wording should be improved.)</p> <ul style="list-style-type: none"> <li>a. <math>\frac{6}{12}</math></li> <li>b. <math>\frac{9}{12}</math></li> <li>c. <math>\frac{12}{20}</math></li> <li>d. <math>\frac{18}{20}</math></li> </ul>	<p>Supplement while teaching</p> <p><i>Bits and Pieces I</i></p>
6.N.8	Distinguish the difference between rate and ratio.	<p>Supplement while teaching</p> <p><i>Bits and Pieces I</i>, Inv. 6</p>
6.N.9	Solve proportions using equivalent fractions.	<p>Supplement while teaching</p> <p><i>Bits and Pieces I</i>, Inv. 6</p>
6.N.10	Verify the proportionality using the product of the means equals the product of the extremes.	<p>Supplement while teaching</p> <p><i>Bits and Pieces I</i>, Inv. 6</p>
6.N.11	<p>Read, write, and identify percents of a whole (0% to 100%).</p> <p><u>Sample Test 2005</u></p> <p>Louis is climbing steps to the top of a monument. After climbing 15 steps, Louis stops to tie his shoe. If there is a total of 75 steps on the monument, what percent of the total number of steps has Louis climbed when he stops to tie his shoe?</p> <ul style="list-style-type: none"> <li>a. 90%</li> <li>b. 60%</li> <li>c. 20%</li> <li>d. 5%</li> </ul> <p><u>Test 2006</u></p> <p>(Match not verified)</p> <p>Mr. Jenkins wants to distribute 40 fliers. He has distributed 30 fliers so far. What percent of the total number of fliers has Mr. Jenkins distributed?</p> <ul style="list-style-type: none"> <li>a. 60%</li> <li>b. 70%</li> <li>c. 75%</li> <li>d. 80%</li> </ul> <p><u>Test 2006</u></p> <p>(Match not verified)</p> <p>In Ms. Fletcher's class, 7 of the 20 students attend an after school art program. What percent of the students attend the after school art program?</p> <p>Show your work.</p>	<p>CMP</p> <p><i>Bits and Pieces I</i></p> <p>6.1</p> <p>CMP2</p> <p><i>Bits and Pieces I</i></p> <p>4.1</p>

6.N.12	<p>Solve percent problems involving percent, rate, and base.</p> <p><u>Sample Test 2005</u></p> <p>On Friday and Saturday, there were a total of 200 cars in the parking lot of a movie theater. On Friday, 120 cars were in the parking lot.</p> <p>Part A</p> <p>What percent of the total number of cars were in the parking lot on Friday?</p> <p>Show your work.</p> <p>Part B</p> <p>What percent of the total number of cars were in the parking lot on Saturday?</p> <p>Show your work.</p> <p><u>Test 2006</u></p> <p>(Match not verified)</p> <p>At Anthony's school, 25% of the 72 sixth-grade students wear either glasses or contact lenses.</p> <p>Part A</p> <p>How many sixth-grade students wear either glass or contact lenses?</p> <p>Show your work.</p> <p>Part B</p> <p>There are 9 students who wear glasses. Of the students who wear glasses or contact lenses, what percent wear glasses?</p> <p>Show your work.</p>	<p>CMP</p> <p><i>Bits and Pieces I</i></p> <p>6.2</p> <p>CMP2</p> <p><i>Bits and Pieces I</i></p> <p>4.3</p>
6.N.13	<p>Define absolute value and determine the absolute value of rational numbers (including positive and negative).</p>	<p><u>Supplement</u></p> <p>(This will be taught in 7<sup>th</sup> grade during <i>Accentuate the Negative.</i>)</p>
6.N.14	<p>Locate rational numbers on a number line (including positive and negative).</p> <p><u>Test 2006</u></p> <p>(Match not verified)</p> <p>Which point on the number line is greater than -4 but less than 0?</p> <p>(Illustration of number line with point F on -5, G on -2, H on 3, J on 5. Values shown on the number line are -6, 0, and 6.)</p> <ol style="list-style-type: none"> <li>F</li> <li>G</li> <li>H</li> <li>J</li> </ol> <p><u>Test 2006</u></p> <p>(Match not verified)</p> <p>What number is represented by point x on the number line?</p> <p>--I---I---I-x-I---I---I---I---I---</p> <p>-12    -8       -4       0       4</p> <ol style="list-style-type: none"> <li>-6</li> <li>-7</li> </ol>	<p>CMP</p> <p><i>Bits and Pieces I</i></p> <p>1.2, 1.5, 2.2, 2.5, 5.2</p> <p>CMP2</p> <p><i>Bits and Pieces I</i></p> <p>1.2, 2.2, 2.5</p>

	c. -9 d. -10	
6.N.15	<p>Order rational numbers (including positive <u>and negative</u>).  <u>Sample Test 2005</u>  Jordan went swimming each day of his vacation. On Monday he swam for <math>\frac{3}{4}</math> of an hour, on Tuesday he swam for <math>2\frac{1}{4}</math> hours, on Wednesday he swam for <math>\frac{1}{2}</math> of an our, on Thursday he swam for <math>1\frac{3}{4}</math> hours and on Friday he swam for <math>\frac{1}{4}</math> of an hour.  Which list shows the times in order from <b>shortest</b> to <b>longest</b>?</p> <p>a. <math>2\frac{1}{4}, 1\frac{3}{4}, \frac{3}{4}, \frac{1}{2}, \frac{1}{4}</math>  b. <math>\frac{3}{4}, 2\frac{1}{4}, \frac{1}{2}, 1\frac{3}{4}, \frac{1}{4}</math>  c. <math>\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1\frac{3}{4}, 2\frac{1}{4}</math>  d. <math>\frac{1}{4}, \frac{1}{2}, 2\frac{1}{4}, \frac{3}{4}, 1\frac{3}{4}</math></p>	<p>CMP  <i>Bits and Pieces I</i>  2.4, 4.3</p> <p>CMP2  <i>Bits and Pieces I</i>  2.3, 2.4, 3.3, 3.5, 4.2</p>
6.N.16	Add and subtract fractions with unlike denominators.	<p>CMP  <i>Bits and Pieces II</i>  4.1, 4.2, 4.3, 4.4</p> <p>CMP2  <i>Bits and Pieces II</i>  2.1, 2.2, 2.3, 2.4</p>
6.N.17	<p>Multiply and divide fractions with unlike denominators.  <u>Sample Test 2005</u>  Cathleen planned to walk her dog for <math>\frac{3}{4}</math> of a mile. After it started to rain, she decided to walk only <math>\frac{1}{2}</math> of that distance.  What fraction of a mile did Cathleen walk her dog?</p> <p>a. <math>\frac{1}{4}</math>  b. <math>\frac{3}{8}</math>  c. <math>\frac{4}{6}</math>  d. <math>\frac{4}{8}</math></p> <p><u>Test 2006</u>  (Match not verified)  Jackie wants to plant <math>2\frac{1}{2}</math> rows of corn in her garden. She needs <math>3\frac{1}{4}</math> ounces of seed for each row. How many total ounces of seed should Jackie buy?</p> <p>a. <math>8\frac{1}{8}</math>  b. <math>6\frac{1}{8}</math>  c. <math>5\frac{3}{4}</math>  d. <math>5\frac{2}{6}</math></p>	<p>CMP  <i>Bits and Pieces II</i>  5.1, 5.2, 5.3, 5.4, 7.1, 7.2, 7.3</p> <p>CMP2  <i>Bits and Pieces II</i>  3.1, 3.2, 3.5, 4.1, 4.2, 4.4</p>
6.N.18	Multiply and divide mixed numbers with unlike denominators.	<p>CMP  <i>Bits and Pieces II</i>  5.2, 5.3, 5.4, 7.2, 7.3</p> <p>CMP2  <i>Bits and Pieces II</i>  3.3, 3.4, 3.5, 4.3, 4.4</p>



6.N.19	Identify the multiplicative inverse (reciprocal) of a number.	<p>CMP <i>Bits and Pieces II</i> Inv. 7, ACE Extensions 45-48</p> <p>CMP2 <i>Bits and Pieces II</i> Inv. 4, ACE 36</p>
6.N.20	Represent fractions as terminating or <u>repeating decimals</u> .	<p>CMP <i>Bits and Pieces I</i> 5.1, 5.2</p> <p>CMP2 <i>Bits and Pieces I</i> 3.1, 3.2, 3.3, 3.4</p>
6.N.21	Find multiple representations of rational numbers (fractions, decimals, and percents 0 to 100).	<p>CMP <i>Bits and Pieces I</i> 6.2, 6.3, 6.4</p> <p>CMP2 <i>Bits and Pieces I</i> 3.1, 3.2, 3.4, 4.3, 4.4</p>
6.N.22	<p>Evaluate numerical expressions using order of operations (may include exponents of two and three). <u>Sample Test 2005</u> Simplify the expression below.  <math display="block">6 \times 4 \quad 2 + 3^3</math> <div style="text-align: center;">divided by</div> </p> <p>Show your work. <u>Test 2006</u> (Match not verified) Simplify the expression below.  <math display="block">(6 + 3^2) \times 4</math> a. 36 b. 42 c. 48 d. 60</p>	<p><u>Supplement</u> (This is found in CMP2, <i>Accentuate the Negative</i> and in CMP, <i>Say It with Symbols</i>).</p>
6.N.23	Represent repeated multiplication in exponential form.	<u>Supplement</u>
6.N.24	<p>Represent exponential form as repeated multiplication. <u>Sample Test 2005</u> Phillip writes the expression <math>2^7</math>. Which is another way to write the same expression using repeated multiplication?</p> a. $2 \times 7$ b. $7 \times 7$ c. $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$ d. $7 \times 7 \times 7 \times 7 \times 7 \times 7 \times 7$	<u>Supplement</u>

6.N.25	<p>Evaluate expressions having exponents where the power is an exponent of one, two, or three.</p> <p><u>Sample Test 2005</u></p> <p>Simplify the expression below.</p> $5^2 - 2^3$ <p>a. 2 b. 4 c. 17 d. 19</p> <p><u>Test 2006</u> (Match not verified)</p> <p>Simplify the expression below.</p> $3^2 + 1^2$ <p>a. 10 b. 11 c. 28 d. 29</p> <p><u>Test 2006</u> (Match not verified)</p> <p>Avery is comparing two expressions. The first expression is <math>8^3</math>. The second expression is <math>3^5</math>. Which expression is greater? Show your work.</p>	<u>Supplement</u>
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**Students will compute accurately and make reasonable estimates.**

6.N.26	<p>Estimate a percent of quantity (0% to 100%).</p> <p><u>Sample Test 2005</u></p> <p>Jordan has a bag that contains 246 marbles. There are 51 brown marbles and 195 gray marbles.</p> <p>Part A</p> <p><b>Estimate</b> the percent of brown marbles in the bag. On the lines below, use words, symbols, or numbers to explain how to estimate the percent of brown marbles in the bag.</p> <p>Part B</p> <p>Jordan adds 12 red marbles to the bag. Estimate the percent of marbles in the bag that are red. Show your work</p> <p><u>Test 2006</u> Match not verified</p> <p>Frank's grocery bill is \$40.43. After Frank uses some coupons, the bill is \$30.35.</p> <p>Part A</p> <p>By rounding to the nearest dollar, estimate the amount of money Frank saved.</p> <p>Part B</p> <p>What is the approximate percent that Frank saved on his grocery bill.</p>	<p>CMP <i>Bits and Pieces II</i>, Inv. 1, 6</p> <p>CMP2 <i>Bits and Pieces III</i>, 4.1, 4.2</p>
6.N.27	Justify the reasonableness of answers using estimation	Throughout

	(including rounding).	
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## ***Algebra Strand***

**Students will represent and analyze algebraically a wide variety of problem solving situations.**

6.A.1	<p>Translate two-step verbal expressions into algebraic expressions.</p> <p><u>Sample Test 2005</u></p> <p>Pat threw a football 5 more than twice the number of yards, <math>y</math>, that Gary threw. Which expression can be used to find the number of yards Pat threw the football?</p> <ol style="list-style-type: none"> <li><math>2y - 5</math></li> <li><math>2y + 5</math></li> <li><math>5y - 2</math></li> <li><math>5y + 2</math></li> </ol> <p><u>Test 2006</u> (Match not verified)</p> <p>Sarah collects stamps and keeps them in envelopes. She had 9 envelopes with a certain number of stamps, <math>s</math>, in each envelope. She sells 3 of the envelopes. Which expression represents the number of stamps Sarah has left?</p> <ol style="list-style-type: none"> <li><math>9s - 3</math></li> <li><math>(9 + 3)s</math></li> <li><math>9s - 3s</math></li> <li><math>9s - s - 3</math></li> </ol> <p><u>Test 2006</u> (Match not verified)</p> <p>On Friday, Lewis saw a certain number of hummingbirds, <math>h</math>. On Saturday, he saw 3 more than twice the number of hummingbirds he saw on Friday. Write an expression for the number of hummingbirds Lewis saw on Saturday.</p>	Use Supplementary Materials
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**Students will perform algebraic procedures accurately.**

6.A.2	<p><b>Use substitution to evaluate algebraic expressions (may include exponents of one, two and three).</b></p> <p><b>(Post-March)</b></p>	Partially through Formulas in Covering and Surrounding Supplement.
6.A.3	<p><b>Translate two-step verbal equations into algebraic equations.</b></p> <p><b>(Post-March)</b></p> <p>Test 2006 at Grade 7 Match not verified</p> <p>Marcus buys three notebooks for school. Each notebook is the same price. Marcus uses a coupon that is worth \$2 off his total purchase. He pays a total of \$7 with the coupon. Which equation can be used to find the cost of one notebook, <math>n</math>?</p> <ol style="list-style-type: none"> <li><math>3n - 2 = 7</math></li> <li><math>3n + 2 = 7</math></li> </ol>	Supplement

	<p>c. <math>3(n - 2) = 7</math>  d. <math>3(n + 2) = 7</math>  e.</p>	
6.A.4	<p><b>Solve and explain two-step equations involving whole numbers using inverse operations. (Post-March)</b>  <u>Sample Test 2005</u>  Mr. Bryant writes the expression below:  <math>9^2/3(n)</math>  (Test uses division symbol.)  What is the value of the expression when <math>n = 3</math>?  a. 27  b. 9  c. 3  d. 2</p> <p><u>Test 2006</u>  (Match not verified)  Mel wrote the express below.  <math>4n \times 2</math>  If <math>n</math> equals 6, what is the value of the expression?  a. 48  b. 26  c. 20  d. 12</p> <p><u>Test 2006</u>  (Match not verified)  Which equation is true when <math>x = 0</math> ?  a. <math>6 - x + 2 + 4</math>  b. <math>2 + 6 - x = 4</math>  c. <math>x - 6 + 2 = 4</math>  d. <math>6 + x - 2 = 4</math></p> <p>Erin shops at two stores for a new sweater. The sweater at the first store costs \$15 less than three times the cost, <math>c</math>, of the sweater at the second store. The sweater at the first store costs \$90. The equation below can be used to determine the cost of the sweater at the second store.</p> $3c - 15 = 90$ <p>Solve the equation to find the cost of the sweater at the second store.  Show your work.  <u>Test 2006</u>  (Match not verified)  What value for <math>n</math> makes the equation true?  <math>3 \times n = 1</math>  a. -3  b. <math>1/3</math></p>	<p><u>Supplement</u></p>

	<p>c. <math>\frac{2}{3}</math> d. 2</p> <p><u>Test 2006</u> (Match not verified) Solve the equation below for r. <math>r - 9 = 16</math>. Show your work.</p>	
6.A.5	<p><b>Solve simple proportions within context. (Post-March)</b> <u>Sample Test 2005 @ 7<sup>th</sup> grade</u> Gilda's family goes on a vacation. They travel 125 miles in the first 2.5 hours. If Gilda's family continues to travel at this rate, how many miles will they travel in 6 hours?</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;">Distance = rate x time</div> <p>Show your work.</p>	<u>Supplement</u>
6.A.6	<p>Evaluate formulas for given input values (circumference, area, volume, distance, temperature, interest, etc.). <u>Sample Test 2005</u> Willard has a stained glass window with one triangular piece, as shown below. (Illustration appears to be an isosceles triangle with a height of 6 inches and a base of 8 inches.)</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;"><math>A = \frac{1}{2}bh</math></div> <p>a. 14 b. 24 c. 48 d. 96</p> <p><u>Test 2006</u> (Match not verified) Keesha will paint one rectangular wall of her bedroom. The wall measures 10 feet by 8 feet. What is the area of the wall that Keesha will paint?</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;"><math>A = l \times w</math></div> <p>a. 18 square feet b. 64 square feet c. 80 square feet d. 100 square feet</p> <p><u>Test 2006</u> (Match not verified) What is the volume of the cylinder below? (Illustration of cylinder with a radius of 4 inches and a height of 10 inches.)</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;">Volume of Cylinder = <math>\pi r^2h</math></div>	<p><i>CMP</i> <i>Covering and Surrounding, Filling and Wrapping</i> <i>See 6.G.2, 6.G.4, 6.G.7</i></p> <p><i>CMP2</i> <i>Covering and Surrounding, Filling and Wrapping</i> <i>See 6.G.2, 6.G.4, 6.G.7</i></p>

	<p><u>Test 2006</u>  Mia puts pictures into a box like the one shown below.  (Illustration of box having width of 2 feet, length of 6 feet, and height of 4 feet)  Part A.  What is the volume of the box? Use the formula <math>V = lwh</math>.  Show your work.  Part B  If the height of the box is doubled, what will be the volume of the new box?  On the lines below, explain how you found your answer</p>	
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### ***Geometry Strand***

**Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.**

6.G.1	<p>Calculate the length of corresponding sides of similar triangles using proportional reasoning.  <u>Test 2006</u>  (Match not verified)  Two similar triangles are shown below.  (Illustration: Triangle A with side lengths of 8 cm, 10 cm and 14 cm; Triangle B with side lengths of x, 30 cm, and 42 cm)  What is the length of side x in Triangle B?  a. 16 cm  b. 20 cm  c. 24 cm  d. 28 cm</p>	<p>CMP  <i>Stretching and Shrinking</i>  2.1, 2.2,  ACE from Inv. 3   CMP2  <i>Stretching and Shrinking</i>  2.1, 2.3, 4.2</p>
6.G.2	<p>Determine the area of triangles and quadrilaterals (squares, rectangles, rhombi, and trapezoids) and develop formulas.  (Include 6.A.6 and 6.M.7 )  <u>Test 2006</u>  (Match not verified)  Mr. Hill wants to plant grass seed in his yard. He needs to know how much seed he should buy. What is the area of Mr. Hill's yard?  (Illustration shows rectangle 80 feet by 60 feet.)  Answer _____ sq. ft.  On the lines below, explain your answer.</p>	<p>CMP  <i>Covering and Surrounding</i>, 3.1,  5.1, 5.2, 5.3, 6.1,  6.2, 6.3   CMP2  <i>Covering and Surrounding</i>,  2.1, 3.1, 3.2, 3.3,  3.4, 4.1, 4.2, 4.3</p>

6.G.3	<p>Use a variety of strategies to find the area of regular and irregular polygons.</p> <p><u>Sample Test 2005</u>  Jeremy wants to determine the area of his school's library. A diagram of the library is shown below.  (Figure contains an area 5 feet by 30 feet and another 8 feet by 22 feet with no dividing line between the two areas.)  What is the area, in square feet, of the library?  Show your work.</p> <p>On the lines below, explain how you determined the area.</p>	<p>CMP  <i>Covering and Surrounding</i>,  Inv. 6 ACE</p> <p>CMP2  <i>Covering and Surrounding</i>  4.4</p>
6.G.4	<p>Determine the volume of rectangular prisms by counting cubes and develop the formula.  (Include 6.A.6 and 6.M.7)  <u>Sample Test 2005</u>  Max is building a rectangular prism out of wooden cubes.</p> <p>(Illustration is prism 6 units long, 4 units wide, and 3 units high with individual cubes showing and a key that one cube = 1 cubic inch.)</p> <p>What is the volume of Max's rectangular prism?</p> <ol style="list-style-type: none"> <li>13 cubic inches</li> <li>24 cubic inches</li> <li>48 cubic inches</li> <li>72 cubic inches</li> </ol>	<p>CMP  <i>Filling and Wrapping</i>, 2.1  (Volume only),  3.1</p> <p>CMP2  <i>Filling and Wrapping</i>, 2.1  (Volume only)  2.3</p>
6.G.5	<p>Identify radius, diameter, <u>chords</u>, and <u>central angles</u> of a circle.  <u>Sample Test 2005</u>  What line segment represents a diameter of circle D below?  (Illustration is a circle with center at D, radius DG, Diameter XY, chord EF.)</p> <ol style="list-style-type: none"> <li>XY</li> <li>DY</li> <li>DG</li> <li>EF</li> </ol> <p>(Segment notation is used in each response.)</p>	<p>CMP  <i>Covering and Surrounding</i> 7.1</p> <p>CMP2  <i>Covering and Surrounding</i>,  5.2</p>
6.G.6	<p>Understand the relationship between the diameter and radius of a circle.  <u>Test, 2006</u>  (Match not verified)  A circle has a diameter, NQ, as shown below.  (Illustration of circle with diameter NQ passing through center, K. Radius KP with length of 3 inches)  The radius KP is 3 inches. What is the length of NQ?  (Item includes segment notation over NQ and KP.)</p> <ol style="list-style-type: none"> <li>3 inches</li> </ol>	<p>CMP  <i>Covering and Surrounding</i> 7.1</p> <p>CMP2  <i>Covering and Surrounding</i>,  5.2</p>

	<p>b. 4 inches c. 6 inches d. 9 inches e.</p> <p><u>Test 2006</u> (Match not verified) The largest pizza for sale at Shawna's Pizza Parlor has a radius of 12 inches. What is the diameter of this pizza?</p> <p>a. 6 inches b. 24 inches c. 36 inches d. 48 inches</p>	
6.G.7	<p>Determine the area and circumference of a circle, using the appropriate formula. (Include 6.A.6 and 6.M.7))</p>	<p>CMP <i>Covering and Surrounding</i>, 7.2, 7.3, 7.4</p> <p>CMP2 <i>Covering and Surrounding</i>, 5.2, 5.3, 5.4</p>
6.G.8	<p>Calculate the area of a sector of a circle, given the measure of a central angle and the radius of the circle. Sample Test 2005 Janice is painting a circular table top, as shown below.</p> <p>(Illustration is a circle with a radius of 1.5 feet showing a sector of <math>\frac{1}{4}</math> of the circle to be red.)</p> <p>Janice needs to find the area of the red section of the circular table top in order to buy the right amount of paint. What is the area of the red section of the circular table. Leave your answer in terms of pi.</p> <p>(Formula is provided for area of circle.) Show your work</p>	<p>Supplement during Inv. 7 of <i>Covering and Surrounding</i></p>
6.G.9	<p>Understand the relationship between the circumference and the diameter of a circle.</p>	<p>CMP <i>Covering and Surrounding</i>, 7.2</p> <p>CMP2 <i>Covering and Surrounding</i>, 5.2</p>



Students will apply coordinate geometry to analyze problem solving situations.

6.G.10	<b>Identify and plot points in all four quadrants. (Post-March)</b>  <u>Sample Test 2005 @ 7<sup>th</sup> grade</u> Which figure below represents a rectangle with vertices (3,2), (-1,2), (-1, -1), and (3, -1) a - d. Grids with rectangles at different locations	Supplement when teaching Data About Us, Inv. 4
6.G.11	<b>Calculate the area of basic polygons drawn on a coordinate plane (rectangles and shapes composed of rectangles having sides with integer lengths). (Post-March)</b>  <u>Sample Test 2005 @ 7<sup>th</sup> grade</u> What is the area of the rectangle drawn on the coordinate plane shown below? (Illustration is rectangle on grid with vertices at (-1, -2), (-1, 5), (3, -2), (3, 5) a. 21 square units b. 24 square units c. 28 square units d. 32 square units	Supplement while teaching <i>Covering and Surrounding</i> , Inv. 3.

### *Measurement Strand*

Students will determine what can be measured and how, using appropriate methods and formulas.

6.M.1	Measure capacity and calculate volume of a rectangular prism. <u>Sample Test 2005</u> Charles stores his baseball cards in a container like the one shown below. (Illustration is rectangular prism with length of 9 inches, width of 3 inches and height of 5 inches. Individual cubes are NOT shown.)  What is the volume, in cubic inches, of the container? <div style="border: 1px solid black; padding: 2px; display: inline-block;"><math>V = lwh</math></div> Show your work.	<i>CMP Filling and Wrapping</i> , 2.1 (volume only), 3.1  <i>CMP2 Filling and Wrapping</i> 2.1 (volume only) 2.3
6.M.2	Identify customary units of capacity (cups, pints, quarts, and gallons).	<u>Supplement</u>

6.M.3	<p>Identify equivalent customary units of capacity (cups to pints, pints to quarts, and quarts to gallons).</p> <p><u>Sample Test 2005</u></p> <p>Sasha pours 10 gallons of water into her aquarium. How many quarts of water does Sasha pour into the aquarium?</p> <div style="border: 1px solid black; padding: 2px; margin-bottom: 10px;">1 gallon = 4 quarts</div> <p>a. 10 b. 14 c. 20 d. 40</p> <p><u>Sample Test 2005</u></p> <p>Francis bought 3 gallons of grape juice for a party. How many pints of juice did Francis buy?</p> <div style="border: 1px solid black; padding: 2px; margin-bottom: 10px;"> 1 gallon = 4 quarts  1 quart = 2 pints </div> <p>a. 2 b. 8 c. 16 d. 24</p> <p><u>Test 2006</u> (Match not verified)</p> <p>How many cups are in 5 quarts?</p> <div style="border: 1px solid black; padding: 2px; margin-bottom: 10px;"> 1 quart = 2 pints  1 pint = 2 cups </div> <p>a. 10 b. 20 c. 30 d. 40</p> <p><u>Test 2006</u> (Match not verified)</p> <p>George has a one-gallon container of apple juice. How many cups of apple juice are in the one-gallon container?</p> <div style="border: 1px solid black; padding: 2px; margin-bottom: 10px;"> 1 gallon = 4 quarts  1 quart = 2 pints  1 pint = 2 cups </div> <p>a. 1 b. 4 c. 8 d. 16</p>	<u>Supplement</u>
6.M.4	Identify metric units of capacity (liter and milliliter).	<u>Supplement</u>

6.M.5	<p>Identify equivalent metric units of capacity (milliliter to liter and liter to milliliter).</p> <p><u>Sample Test 2005</u>          Andre used 345 milliliters of solution in his science experiment. How many liters of solution did Andre use?</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;">1 liter = 1,000 milliliters</div> <ul style="list-style-type: none"> <li>a. 34,500</li> <li>b. 3,450</li> <li>c. 3.45</li> <li>d. 0.345</li> </ul> <p><u>Test 2006</u>          (Match not verified)          Giselle had 2 liters of water. She drank 750 milliliters. How many milliliters of water does Giselle have left?</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;">1 liter = 1,000 milliliters</div> <ul style="list-style-type: none"> <li>a. 250</li> <li>b. 1,000</li> <li>c. 1,250</li> </ul> <p>1,750</p>	<u>Supplement</u>
6.M.6	<u>Determine the tool and technique to measure with an appropriate level of precision: capacity.</u>	<u>Supplement</u>

**Students will develop strategies for estimating measurements.**

6.M.7	Estimate volume, area, and circumference (see figures identified in geometry strand).	<p>CMP  <i>Covering and Surrounding, Filling and Wrapping</i>            See 6.G.2, 6.G.4, 6.G.7</p> <p>CMP2  <i>Covering and Surrounding, Filling and Wrapping</i>            See 6.G.2, 6.G.4, 6.G.7</p>
6.M.8	Justify the reasonableness of estimates.	Supplement when teaching 6.

		M.7
6.M.9	Determine personal references for capacity.	Supplement

***Statistics and Probability Strand***

**Students will collect, organize, display and analyze data.**

6.S.1	Develop the concept of sampling when collecting data from a population and decide the best method to collect data for a particular question. (Post-March)	CMP <i>Data About Us</i> – Unit project  CMP2 <i>Data About Us</i> – Unit Project
6.S.2	Record data in a frequency table. (Post-March)	CMP <i>Data About Us</i> – Unit project  CMP2 <i>Data About Us</i> – Unit Project
6.S.3	<u>Construct Venn diagrams to sort data.</u> <u>2005 Sample Test @7<sup>th</sup> Grade</u> Seven girls in Ms. Bauman's class participate in at least one school activity. Mary and Shelly play basketball only; Shawna and Layla sing only; and Trina, Stephanie and Kim play basketball <b>and</b> sing. Which Venn diagram correctly represents the data? a. b. c. and d. have Venn diagrams from which to choose.  <u>Test 2006 at Grade 7</u> Match not verified The list below shows the number of students who participate in football and track at Farrell Middle School. <ul style="list-style-type: none"> <li>• A total of 33 students participate in football.</li> <li>• A total of 24 students participate in track.</li> <li>• There are 8 students who participate in both sports.</li> </ul> Part A Use the list above to complete the Venn diagram in the space below. Be sure to <ul style="list-style-type: none"> <li>• Title the diagram</li> <li>• Label each circle</li> <li>• Place a number in each section of the diagram</li> </ul> (Illustration shows two circles intersecting.) Part B.	Supplement

	What is the total number of students who participate in these sports?											
6.S.4	<p><b>Determine and justify the most appropriate graph to display a given set of data (pictograph, bar graph, line graph, histogram, or circle graph).</b> <b>(Post-March)</b> <u>Test 2006 (Grade 7)</u> Match not verified Tyler surveys his classmates to determine the number and type of pets they have. The frequency table below shows this data.</p> <table><tr><td>Type of Pet</td><td>Number</td></tr><tr><td>Fish</td><td>9 (tally marks)</td></tr><tr><td>Hamster</td><td>3</td></tr><tr><td>Cat</td><td>7</td></tr><tr><td>Dog</td><td>6</td></tr></table> <p>Based on the data, which type of graph is <b>best</b> to display Tyler’s data? On the lines below, explain why the graph you chose is best to display Tyler’s data.</p>	Type of Pet	Number	Fish	9 (tally marks)	Hamster	3	Cat	7	Dog	6	<p><i>CMP</i> <i>Data about</i> <i>Us</i> Unit Project</p> <p>CMP2 <i>Data about</i> <i>Us</i>, Unit Project</p>
Type of Pet	Number											
Fish	9 (tally marks)											
Hamster	3											
Cat	7											
Dog	6											
6.S.5	<p>Determine the mean, mode and median for a given set of data. <u>Sample Test 2005</u> A city council recorded the number of new trees planted at seven of the city’s parks. The number of trees planted is recorded below. 29, 11, 13, 29, 7, 21, 16 What is the median number of trees?</p> <p>a. 16 b. 18 c. 21 d. 29</p> <p><u>Test 2006</u> (Match not verified) Ben recorded the number of customers who shopped at his pet store every day for one week. The results are shown below. 42, 35, 56, 29, 42, 39, 23 What is the mean number of customers who shopped at the pet store?</p> <p>a. 33 b. 38 c. 39 d. 42</p>	<p><i>CMP</i> <i>Data about</i> <i>Us</i>, 1.3, 1.4, 5.1, 5.2</p> <p>CMP2 <i>Data about</i> <i>Us</i>, 1.2, 1.3, 3.1, 3.2, 3.3</p>										
6.S.6	Determine the range for a given set of data.	<p><i>CMP</i> <i>Data about</i> <i>Us</i>, 1.3</p> <p>CMP2</p>										

		<i>Data about Us, 1.2</i>
6.S.7	<p>Read and interpret graphs.  <u>Sample Test 2005</u>  The graph below shows the number of animals on Glenda's farm.</p> <p>(Illustration is a bar graph showing 15 chickens, 3 horses, 7 pigs, 12 cows. Scale on y-axis is 0-20, increments of 1, markings of 0, 2, 4...)</p> <p>What is the total number of animals on Glenda's farm?</p> <p>a. 15  b. 27  c. 37  d. 38</p>	<p><i>CMP  Data about  Us, 1.1, 1.2  4.1, 4.2</i></p> <p><i>CMP2  Data about  Us, 1.1, 1.5,  2.3, 2.4</i></p>

**Students will make predictions that are based upon data analysis.**

6.S.8	<p>Justify predictions made from data.</p> <p><u>Sample Test 2005</u></p> <p>Barry is training to be a gymnast. He increases the number of push-ups he does each week by following a number pattern. The number of push-ups Barry does for 5 weeks is shown in the table below.</p> <table><tr><th>Week</th><th>Number of push-ups</th></tr><tr><td>1</td><td>16</td></tr><tr><td>2</td><td>19</td></tr><tr><td>3</td><td>22</td></tr><tr><td>4</td><td>25</td></tr><tr><td>5</td><td>28</td></tr></table> <p>Part A</p> <p>If Barry continues to do push-ups according to the number pattern, how many push-ups will he do during the 10<sup>th</sup> week?</p> <p>Show your work.</p> <p>Part B</p> <p>Anne predicts that Barry will do 59 push-ups during the 15<sup>th</sup> week. On the lines below, use words, symbols, or numbers to explain whether Anne's prediction is correct.</p>	Week	Number of push-ups	1	16	2	19	3	22	4	25	5	28	<p>CMP</p> <p><i>Data about</i></p> <p><i>Us, Inv. 1,4,5</i></p> <p>CMP2</p> <p><i>Data about</i></p> <p><i>Us, Inv. 1,2,3</i></p>
Week	Number of push-ups													
1	16													
2	19													
3	22													
4	25													
5	28													

**Students will understand and apply concepts of probability.**

6.S.9	<p><u>Test 2006</u> (Match not verified) Jason has a jar that holds one dime, two nickels, and one quarter. He randomly removes three coins from the jar. Which combination is <b>not</b> a possible outcome?</p> <ul style="list-style-type: none"> <li>a. one dime, one nickel, and one quarter</li> <li>b. one quarter and two dimes</li> <li>c. one dime and two nickels</li> <li>d. two nickels and one quarter</li> </ul> <p><u>Test 2006 at Grade 7</u> (Match not verified) Keisha has one penny, one nickel, and one dime in her pocket. She randomly takes one coin out of her pocket. Without putting it back, she randomly takes out another coin. If Keisha lists all the possible outcomes of picking the two coins one at a time, how many outcomes are there?</p> <ul style="list-style-type: none"> <li>a. 2</li> <li>b. 3</li> <li>c. 4</li> <li>d. 6</li> </ul>	<p>CMP and CMP2 Selected activities from <i>How Likely Is It?</i> are recommended before supplementing compound events.</p>
6.S.10	<p><b>Determine the probability of dependent events.</b> <b>(Post-March)</b> <u>Sample Test 2005 @ 7<sup>th</sup> Grade</u> Eric's mother wants to help him with his math homework. She puts 24 cookies in a cookie jar. Twelve of the cookies are chocolate chip, 8 are oatmeal, and 4 are peanut butter. She then has Eric select a cookie from the jar without looking. Next, without replacing the first cookie, Eric picks a second cookie without looking in the jar. What is the probability Eric will pick an oatmeal cookie first and a chocolate chip cookie second?</p> <ul style="list-style-type: none"> <li>a. <math>\frac{1}{6}</math></li> <li>b. <math>\frac{4}{23}</math></li> <li>c. <math>\frac{5}{6}</math></li> <li>d. <math>\frac{59}{69}</math></li> </ul>	<p>CMP and CMP2 Selected activities from <i>How Likely Is It?</i> are recommended before supplementing dependent events.</p>

	<p><u>Sample Test 2005 @ 7<sup>th</sup> grade</u></p> <p>Jesse predicted that his batting average after the first 5 games of the season would be higher than .300. The table below records Jesse's hits and times at bat during the first 5 games. Batting average is equal to hits divided by times at bat.</p> <table border="1"> <thead> <tr> <th>Games</th><th>Times at bat</th><th>Hits</th></tr> </thead> <tbody> <tr> <td>1</td><td>4</td><td>0</td></tr> <tr> <td>2</td><td>5</td><td>1</td></tr> <tr> <td>3</td><td>4</td><td>2</td></tr> <tr> <td>4</td><td>3</td><td>1</td></tr> <tr> <td>5</td><td>4</td><td>2</td></tr> </tbody> </table> <p>How accurate was Jesse's prediction concerning his batting average?</p> <ol style="list-style-type: none"> <li>It was lower than he predicted.</li> <li>It was higher than he predicted.</li> <li>It was equal to his predictions.</li> <li>The batting average cannot be determined.</li> </ol> <p><u>Test 2006.</u></p> <p>(Match not verified)</p> <p>Kyle has a container that holds 60 paperclips. Half of the paperclips are metal. The other half are colored plastic: 10 red, 10 green, and 10 blue.</p> <p>Part A</p> <p>If Kyle randomly takes a paperclip out of the container, what is the probability that the paperclip will be colored plastic?</p> <p>Part B</p> <p>If Kyle randomly takes a paperclip out of the container, what is the probability that the paperclip will be red or green?</p> <p>On the lines below, explain your answer.</p>	Games	Times at bat	Hits	1	4	0	2	5	1	3	4	2	4	3	1	5	4	2	
Games	Times at bat	Hits																		
1	4	0																		
2	5	1																		
3	4	2																		
4	3	1																		
5	4	2																		
6.S.11	<p><b>Determine the number of possible outcomes for a compound event by using the fundamental counting principle and use this to determine the probabilities of events when the outcomes have equal probability.</b></p> <p><b>(Post-March)</b></p> <p><u>Sample Test 2005 @ 7<sup>th</sup> Grade</u></p> <p>Tonysha has two bags. Each bag has three objects in it. The first bag has one dime, one nickel, and one penny. The second bag has one red button, one blue button, and one yellow button. Tonysha picks one object from each bag. How many possible</p>	<p>CMP and CMP2 Selected activities from <i>How Likely Is It?</i> are recommended before supplementing use of the Fundamental Counting Principle.</p>																		



	<p>combinations of two objects can she pick?</p> <p>a. 3 b. 6 c. 9 d. 15</p> <p><u>Sample Test 2005 @ 7<sup>th</sup> grade</u></p> <p>A shipping company uses baggage tags with 3-letter city codes. The first and third letters of each code are always consonants and the middle letter is always a vowel. The English language uses 21 consonants and 5 vowels. How many different combinations of tag codes are possible?</p> <p>a. 105 b. 441 c. 1,638 d. 2,205</p> <p><u>Test 2006 at Grade 7</u></p> <p>Heather stands in the lunch line at school. For her meal, she can choose spaghetti or pizza. She can also have apple juice, orange juice, or milk. How many different combinations of one meal and one drink can Heather choose?</p> <p>a. 2 b. 3 c. 5 d. 6</p>	
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**5.A.5** Solve and explain simple one-step equations using inverse operations involving whole numbers.

Test 2006 at Grade 6

Which equation can be used to help solve the equation below?

$$\underline{\hspace{1cm}} \times 6 = 420$$

- a.  $\underline{\hspace{1cm}} = 420 + 6$   
b.  $\underline{\hspace{1cm}} = 420 - 6$   
c.  $\underline{\hspace{1cm}} = 420 \times 6$   
d.  $\underline{\hspace{1cm}} = 420/6$

**5.G.14** Calculate perimeter of basic geometric shapes drawn on a coordinate plane (rectangles and shapes composed of rectangles having sides with integer lengths and parallel to the axes).

Test 2006 at Grade 6

Part A

On the grid below, draw a rectangle with a perimeter of 34 units.

Illustration is Quadrant I of a coordinate plane.

Part B

What are the lengths of each side of the rectangle?

**5.G.12 Identify and plot points in the first quadrant.**

Test 2006 at Grade 6

Match not verified

Jamie created a map for his friends. Each point on the map represents a different location.

(Map on coordinate grid with school at (3,4), Jamie's house at (2,3), Library at (3,2) and Zoo at (4,3).)

What coordinates represent Jamie's house?

- a. (2, 3)
- b. (3, 2)
- c. (3, 4)
- d. (4, 3)

**5.S.6 Record experiment results using fractions/ratios.**

Test 2006 at Grade 6

Diane tossed a coin 20 times. She recorded whether the coin landed heads up or tails up.

The results are shown in the table below.

Position	Number of Times
Heads up	12 (tally marks)
Tails up	8

What fraction of the coin tosses landed tails up?

- a.  $\frac{1}{8}$
- b.  $\frac{2}{3}$
- c.  $\frac{2}{5}$
- d.  $\frac{3}{5}$

## ***Bits and Pieces I***

( Pre-March and prior to Bits and Pieces II and How Likely Is It?)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
1.2, 1.2, 1.5	6.N.14 Locate rational numbers on a number line (including positive and negative).	Supplement Negative
2.2, 2.4, 2.5	6.N.14 Locate rational numbers on a number line (including positive and negative). 6.N.15 Order rational numbers (including positive and negative).	Supplement Negative
4.3	6.N.15 Order rational numbers (including positive and negative).	Supplement Negative
5.1, 5.2	6.N.14 Locate rational numbers on a number line (including positive <u>and negative</u> ). 6.N.20 Represent fractions as terminating or <u>repeating decimals</u> .	Supplement Negative
6.1, 6.2, 6.3	6.N.6 Understand the concept of rate. 6.N.11 Read, write, and identify percents of a whole (0% to 100%). 6.N.12 Solve percent problems involving percent, rate and base. 6.N.21 Find multiple representations of rational numbers (fractions decimals, and percents 0 to 100).	Supplement 6.N.8 Distinguish the difference between rate and ratio. 6.N.10 Verify the proportionality using the product of the means equals the product of the extremes.

## ***Bits and Pieces II***

(Pre-March and after Bits and Pieces I)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
1.1, 1.2, 1.3	6.N.6 Understand the concept of rate. 6.N.26 Estimate a percent of a quantity.	
4.1, 4.2, 4.3, 4.4	6.N.16 Add and subtract fractions with unlike denominators.	Supplement: 6.N.2 Define and identify the commutative and associative properties of addition and multiplication. 6.N.3 Define and identify the distributive property of multiplication over addition. 6.N.4 Define and identify the identity and inverse properties of addition and multiplication.
5.1, 5.2, 5.3, 5.4	6.N.17 Multiply and divide fractions with unlike denominators. 6.N.18 Multiply and divide mixed numbers with unlike denominators.	Supplement: 6.N.2 Define and identify the commutative and associative properties of addition and multiplication. 6.N.3 Define and identify the distributive property of multiplication over addition. 6.N.4 Define and identify the identity and inverse properties of addition and multiplication. 6.N.5 Define and identify the zero property of multiplication.
7.1, 7.2, 7.3	6.N.17 Multiply and divide fractions with unlike denominators. 6.N.18 Multiply and divide mixed numbers with unlike denominators. 6.N.19 Identify the multiplicative inverse (reciprocal) of a number.	

## ***Covering and Surrounding***

( Pre-March and prior to Filling and Wrapping)

Inv./ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
3.1	6.G.2 Determine the area of triangles and quadrilaterals (squares, rectangles, rhombi, and trapezoids) and develop formulas. <i>(Include 6.A.6 and 6.M.7 )</i> 6.A.6 Evaluate formulas for given input values (circumference, area, volume, distance, temperature, interest, etc.).	Supplement: 6.M.7 Estimate volume, area, and circumference (see figures identified in geometry strand). 6.M.8 Justify the reasonableness of estimates.
5.2, 5.3	6.G.2 Determine the area of triangles and quadrilaterals (squares, rectangles, rhombi, and trapezoids) and develop formulas. 6.G.3 Use a variety of strategies to find the area of regular and irregular polygons 6.A.6 Evaluate formulas for given input values (circumference, area, volume, distance, temperature, interest, etc.).	Supplement: 6.M.7 Estimate volume, area, and circumference (see figures identified in geometry strand). 6.M.8 Justify the reasonableness of estimates.
6.1, 6.2, 6.3	6.G.2 Determine the area of triangles and quadrilaterals (squares, rectangles, rhombi, and trapezoids) and develop formulas. 6.G.3 Use a variety of strategies to find the area of regular and irregular polygons 6.A.6 Evaluate formulas for given input values (circumference, area, volume, distance, temperature, interest, etc.).	6.M.7 Estimate volume, area, and circumference (see figures identified in geometry strand). 6.M.8 Justify the reasonableness of estimates.
7.1, 7.2, 7.3	6.G.5 Identify radius, diameter, chords, and central angles of a circle. 6.A.6 Evaluate formulas for given input values (circumference, area, volume, distance, temperature, interest, etc.). 6.G.7 Determine the area and circumference of a circle, using the appropriate formula. 6.G.9 Understand the relationship between the circumference and the diameter of a circle. 6.A.6 Evaluate formulas for given input	Supplement chords and central angles.  Supplement 6.G.8 <u>Calculate the area of a sector of a circle, given the measure of a central angle and the radius of the circle.</u> 6.M.7 Estimate volume, area, and circumference (see

	values (circumference, area, volume, distance, temperature, interest, etc.).	figures identified in geometry strand). 6.M.8 Justify the reasonableness of estimates.
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## ***Data About Us***

( Pre-March)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
1.1, 1.2, 1.3, 1.4, 1.5	6.S.5 Determine the mean, mode and median for a given set of data. 6.S.6 Determine the range for a given set of data. 6.S.7 Read and interpret graphs. 6.S.8 Justify predictions made from data	
4.1, 4.2	6.S.7 Read and interpret graphs. 6.S.8 Justify predictions made from data.	Supplement: 6.G.10 Identify and plot points in all four quadrants.
5.1, 5.2	6.S.5 Determine the mean, mode and median for a given set of data. 6.S.8 Justify predictions made from data.	
Unit Project	<b>6.S.1 Develop the concept of sampling when collecting data from a population and decide the best method to collect data for a particular question. (Post-March)</b> <b>6.S.2 Record data in a frequency table. (Post-March)</b> <b>6.S.4 Determine and justify the most appropriate graph to display a given set of data (pictograph, bar graph, line graph, histogram, or circle graph). (Post-March)</b>	

## ***Filling and Wrapping***

(Pre-March and after Covering and Surrounding)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
2.1, 3.1 Volume only, Omit surface area.	6.G.4 Determine the volume of rectangular prisms by counting cubes and develop the formula. 6.M.1 Measure capacity and calculate volume of a rectangular prism. 6.A.6 Evaluate formulas for given input values (circumference, area, volume, distance, temperature, interest, etc.).	6.M.7 Estimate volume, area, and circumference (see figures identified in geometry strand). 6.M.8 Justify the reasonableness of estimates.

## ***How Likely Is It?***

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
Selected Activities from Unit for a Foundation before supplementing.	Foundation for PI's to be supplemented.	Supplement: <b>6.S.9 List possible outcomes for compound events. (Post-March)</b> <b>6.S.10 Determine the probability of dependent events. (Post-March)</b> <b>6.S.11 <u>Determine the number of possible outcomes for a compound event by using the fundamental counting principle and use this to determine the probabilities of events when the outcomes have equal probability.</u> (Post-March)</b>

## ***Stretching and Shrinking***

(Pre-March)

2.1, 2.1	6.N.7 Express equivalent ratios as a proportion	<b>6.A.5 Solve simple proportions within context. (Post-March)</b>
Selected ACE from Inv. 3	6.N.9 Solve proportions using equivalent fractions. 6.G.1 Calculate the length of corresponding sides of similar triangles using proportional reasoning	Supplement 6.N.8 Distinguish the difference between rate and ratio. 6.N.10 Verify the proportionality using the product of the means equals the product of the extremes.

## **Use Supplementary Materials**

(Pre-March)

Source	New York Performance Indicator	Estimated Time/Notes
	6.N.1 Read and write whole numbers to trillions	
	6.N.13 Define absolute value and determine the absolute value of rational numbers (including positive and negative).	
	6.N.22 Evaluate numerical expressions using order of operations (may include exponents of two and three).	
	6.N.23 Represent repeated multiplication in exponential form.	
	6.N.24 Represent exponential form as repeated multiplication.	
	6.N.25 Evaluate expressions having exponents where the power is an exponent of one, two, or three.	



## Use Supplementary Materials

(Pre-March)

Source	New York Performance Indicator	Estimated Time/Notes
	6.M.2 <u>Identify customary units of capacity (cups, pints, quarts, and gallons).</u>	
	6.M.3 <u>Identify equivalent customary units of capacity (cups to pints, pints to quarts, and quarts to gallons).</u>	
	6.M.4 <u>Identify metric units of capacity (liter and milliliter).</u>	
	6.M.5 <u>Identify equivalent metric units of capacity (milliliter to liter and liter to milliliter).</u>	
	6.M.6 <u>Determine the tool and technique to measure with an appropriate level of precision: capacity.</u>	
	6.M.9 Determine personal references for capacity.	

## Use Supplementary Materials

Begin Pre-March for 6.A.1 and continue Post-March for remainder.)

Source	New York Performance Indicator	Estimated Time/Notes
	6.A.1 Translate two-step verbal expressions into algebraic expressions.	
	<b>6.A.2 Use substitution to evaluate algebraic expressions (may include exponents of one, two and three). (Post-March)</b>	
	<b>6.A.3 Translate two-step verbal equations into algebraic equations. (Post-March)</b>	

	<b>6.A.4 Solve and explain two-step equations involving whole numbers using inverse operations. (Post-March)</b>	
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# MSTP Document

## Prepared for MSTP Participants by Linda L. Walker

April, 2006

Grade Seven

### *Number Sense and Operations Strand*

**Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.**

7.N.1	<p>Distinguish between the various subsets of real numbers (counting/natural numbers, whole numbers, integers, rational numbers, and irrational numbers).</p> <p>Sample Test 2005 Which number is an irrational number?</p> <ul style="list-style-type: none"> <li>a. <math>(\sqrt{3})^3</math></li> <li>b. -13.5</li> <li>c. <math>\frac{7}{11}</math></li> <li>d. <math>\frac{1}{(\sqrt{9})^9}</math></li> </ul>	<p>CMP <i>Accentuate the Negative</i>, 1.3 (integers) <i>Looking for Pythagoras</i>, 2.2, 5.1, 5.2, 5.3 (repeating decimals, irrationals) CMP2 <i>Looking for Pythagoras</i> 2.2, 4.1 (irrationals)</p>
7.N.2	<p>Recognize the difference between rational and irrational numbers (i.e., explore different approximations of pi).</p>	<p><i>Looking for Pythagoras</i>, 2.1, 2.2 CMP2 <i>Looking for Pythagoras</i> 2.1, 2.2 (irrationals)</p>
7.N.3	<p>Place rational and irrational numbers (approximations) on a number line and justify the placement of the numbers.</p>	<p><i>Looking for Pythagoras</i>, 5.1, CMP2 <i>Looking for Pythagoras</i> 4.1</p>
7.N.4	<p>Develop the laws of exponents for multiplication and division.</p> <p>Test 2006 (Match not verified.) Simplify the expression below. <math>2(2^3 \times 2^2)</math></p> <ul style="list-style-type: none"> <li>a. 0</li> <li>b. 4</li> <li>c. 8</li> </ul>	<p>Supplement (Developed to some extent in CMP2, Growing, Growing, Growing)</p>

	d. 16	
7.N.5	<p>Write numbers in scientific notation.</p> <p>Test 2006 (Match not verified.) In the year 2000, approximately 169,000,000 personal computers were used in the United States. What is this number expressed in scientific notation?</p> <ul style="list-style-type: none"> <li>a. <math>1.69 \times 10^{-8}</math></li> <li>b. <math>16.9 \times 10^{-7}</math></li> <li>c. <math>16.9 \times 10^7</math></li> <li>d. <math>1.69 \times 10^8</math></li> </ul>	<p>CMP Data Around Us, Inv. 4/Supplement numbers less than Zero</p> <p>CMP2 Inv. 1, ACE 39 Inv. 4, ACE 8 Inv. 55, ACE 55-60</p>
7.N.6	<p>Translate numbers from scientific notation into standard form.</p> <p>Sample Test 2005 Last year <math>9.9 \times 10^5</math> people attended the New York State Fair. What is this number expressed in standard form?</p> <ul style="list-style-type: none"> <li>a. 9,900</li> <li>b. 99,000</li> <li>c. 990,000</li> <li>d. 9,900,000</li> </ul> <p>Test 2006 (Match not verified.) The average distance from Pluto to the Sun is <math>3.65 \times 10^9</math> miles. What is this number written in standard form?</p> <ul style="list-style-type: none"> <li>a. 365,000,000</li> <li>b. 3,650,000,000</li> <li>c. 36,500,000,000</li> <li>d. 365,000,000,000</li> </ul>	<p>Data Around Us, Inv. 4,5/Supplement numbers less than Zero</p>
7.N.7	<p>Compare numbers written in scientific notation.</p> <p>Sample Test 2005 Which number has the greatest value?</p> <ul style="list-style-type: none"> <li>a. <math>6.7 \times 10^4</math></li> <li>b. <math>7.6 \times 10^{-4}</math></li> <li>c. <math>8.9 \times 10^3</math></li> <li>d. <math>9.8 \times 10^{-3}</math></li> </ul>	<p>Data Around Us, 4.3 Supplement numbers less than Zero</p>

	<p>Test 2006 (Match not verified.) Ming wrote the four numbers below in scientific notation.  <math>5.5 \times 10^5</math>   <math>1.2 \times 10^3</math>  <math>2.8 \times 10^6</math>   <math>7.4 \times 10^2</math>  Which number has the greatest value?  a. <math>5.5 \times 10^5</math>  b. <math>1.2 \times 10^3</math>  c. <math>2.8 \times 10^6</math>  d. <math>7.4 \times 10^2</math></p>	
7.N.8	<p>Find the common factors and greatest common factor of two or more numbers.</p> <p>Sample Test 2005 What is the greatest common factor of 12, 16, and 20?  a. 2  b. 4  c. 6  d. 12</p> <p>Test 2006 (Match not verified.) What is the greatest common factor of 28, 42, and 56?</p>	Prime Time, Inv. 4, 5
7.N.9	<p>Determine multiples and least common multiple of two or more numbers.</p> <p>Sample Test 2005 What is the least common multiple of 3, 6, and 27?  a. 3  b. 27  c. 54  d. 81</p> <p>Sample Test 2005 What is the least common multiple of 4, 5, and 6?</p>	Prime Time, Inv. 4, 5

	<p>Test 2006 (Match not verified.) What is the least common multiple of 3, 6, and 27?</p> <p>a. 3 b. 18 c. 27 d. 54</p>	
7.N.10	<p>Determine the prime factorization of a given number and write in exponential form.</p> <p>Sample Test 2005 Mr. Hardy assigns homework to his mathematics class. The assignment requires students to find the prime factorization of 648. Part A What is the prime factorization of 648? Part B Write the result of the prime factorization of 648 in exponential form.</p>	Prime Time, Inv. 5

**Students will understand meanings of operations and procedures, and how they relate to one another.**

7.N.11	<p>Simplify expressions using order of operations. Note: Expressions may include absolute value and/or integral exponents greater than 0.</p> <p>Sample Test 2005 Simplify the expression below. <math>3^3 - 2^2</math> a. 1 5 23 25</p> <p>Sample Test 2005 Simplify the expression below. <math>(6^2 - 2^4) - (\text{square root})16</math> a. 16 b. 64</p>	<p>CMP <i>Say It with Symbols</i>, Inv. 1</p> <p>CMP2 <i>Accentuate the Negative</i> 4.1</p>
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	<p>c. 80 d. 108</p> <p>Test 2006 (Match not verified.) Simplify the expression below. <math>4 + 2^3 -  -4 </math> (absolute value of -4) a. 6 b. 8 c. 14 d. 16</p>	
7.N.12	<p>Add, subtract, multiply and divide integers.</p> <p>Sample Test 2005 On Friday, Extreme View Helicopter Tours flew 34 times. They flew the same number of times on Saturday as they did on Sunday. The total number of times they flew for the three days was 118. How many times did Extreme View Helicopter Tours fly on Saturday? a. 34 b. 42 c. 59 d. 84</p>	<p>CMP <i>Accentuate the Negative</i> 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4 CMP2 <i>Accentuate the Negative</i> 2.1, 2.2, 2.3, 2.4, 3.1, 3.2, 3.3, 3.4</p>
7.N.13	Add and subtract two integers (with and without the use of a number line).	<i>Accentuate the Negative</i> , 2.1
7.N.14	Develop a conceptual understanding of negative and zero exponents with a base of ten and relate to fractions and decimals (i.e., $10^{-2} = .01 = 1/100$ )	Supplement during <i>Data Around Us</i> in conjunction with 7.N.5, 7.N.6, 7.N.7
7.N.15	<p>Recognize and state the value of the square root of a perfect square (up to 225).</p> <p>Sample Test 2005 Sarah builds a dollhouse. The floor of the dollhouse is square. Sarah covers the floor with 144 square inches of tile. How long, in inches, is one side of the dollhouse floor? a. 12 b. 38 c. 72 d. 144</p>	<p>CMP <i>Looking for Pythagoras</i> 2.2 CMP2 <i>Looking for Pythagoras</i> 2.2</p>
7.N.16	Determine the square root of non-perfect squares using a calculator.	<p>CMP <i>Looking for Pythagoras</i> 2.2 CMP2</p>

		<i>Looking for Pythagoras</i> 2.2
7.N.17	Classify irrational numbers as non-repeating/non-terminating decimals.	<i>CMP</i> <i>Looking for Pythagoras</i> 5.1, 5.2, 5.3 <i>CMP2</i> <i>Looking for Pythagoras</i> 4.1

**Students will compute accurately and make reasonable estimates.**

7.N.18	<p>Identify the two consecutive whole numbers between which the square root of a non-perfect square whole number less than 225 lies (with and without the use of a number line).</p> <p>Sample Test 2005 The Gatlins are buying new carpet for their house. They need about 1,175 square feet of carpet. The carpet they buy is sold by the square yard. Part A <b>Estimate</b> the number of square yards of carpet the Gatlins need for their house. <b>Show your work.</b> Part B On the lines below, describe a strategy the Gatlins should use to correctly estimate the number of square yards of carpet they need for their house.</p> <p>Test 2006 (Match not verified.) Between what two whole numbers is (sq root) 89? a. 7 and 8 b. 8 and 9 c. 9 and 10 d. 10 and 11</p>	<p><i>CMP</i> <i>Looking for Pythagoras</i> 2.2 <i>CMP2</i> <i>Looking for Pythagoras</i> 2.2</p>
7.N.19	Justify the reasonableness of answers using estimation.	Throughout



### *Algebra Strand*

**Students will represent and analyze algebraically a wide variety of problem solving situations.**

7.A.1	<p>Translate two-step verbal expressions into algebraic expressions.</p> <p>Test 2006 at Grade 8 Match not verified.</p> <p>Janine's dog weighs three pounds less than twice the weight of Wanda's dog, <math>d</math>. Which expression represents the weight of Janine's dog?</p> <ul style="list-style-type: none"> <li>a. <math>2 + d - 3</math></li> <li>b. <math>3 + d - 2</math></li> <li>c. <math>2d - 3</math></li> <li>d. <math>3 - 2d</math></li> </ul>	<p>Developed in <i>Variables and Patterns</i> and <i>Moving Straight Ahead</i> – also supplement</p>
7.A.2	<p><b>Add and subtract monomials with exponents of one. (Post-March)</b></p> <p>Test 2006 at Grade 8 Match not verified</p> <p>Simplify the expression below. <math>3x + 9x</math></p> <ul style="list-style-type: none"> <li>a. 12</li> <li>b. <math>12x</math></li> <li>c. <math>12x^2</math></li> <li>d. <math>12(x + x)</math></li> </ul>	<p><i>CMP</i> <i>Say It With Symbols</i> 2.1, 2.2, 3.1</p>
7.A.3	<p><b>Identify a polynomial as an algebraic expression containing one or more terms. (Post-March)</b></p>	<p>Supplement when teaching <i>Say It With Symbols</i> 2.1, 2.2, 3.1</p>

Students will perform algebraic procedures accurately.

<p><b>7.A.4</b></p>	<p><b>Solve multi-step equations by combining like terms, using the distributive property, or moving variables to one side of the equation. (Post-March)</b></p> <p>Sample Test 2005 from 8<sup>th</sup> grade  Bill and Felicia each bake cookies for a party. Bill bakes 3 times as many cookies as Felicia. Felicia bakes 24 fewer cookies than Bill. Bill bakes <math>b</math> cookies and Felicia bakes <math>f</math> cookies. What pair of equation can be used to determine the number of cookies Bill and Felicia bake?</p> <p>a. <math>b = 3(f + 24)</math>  <math>f = b - 24</math></p> <p>b. <math>b = 3f</math>  <math>f = 24 - b</math></p> <p>c. <math>b = 3f</math>  <math>f = b - 24</math></p> <p>d. <math>f = 3b</math>  <math>b = f - 24</math></p> <p>Sample Test 2005 (8<sup>th</sup> grade)  The square of a number, <math>n</math>, is equal to the sum of that number and 5. Which equation represents this relationship?</p> <p><math>2n = n + 5</math>  <math>n^2 = n + 5</math>  <math>2n = n - 5</math>  <math>(n + 5)^2 = n + 5</math></p> <p>Test 2006 at Grade 8  Match not verified  Renee must solve the equation <math>4x + 12 = 6x</math>. If she subtracts <math>4x</math> from the left side of the equation, what should Renee write on the right side of the equation?</p> <p>a. 2  b. <math>2x</math>  c. 10  d. <math>10x</math></p>	<p>CMP  <i>Moving Straight Ahead</i>  4.1, 4.2, 4.3  <i>Say It With Symbols</i>  3.1, 3.2, 4.1, 4.2, 4.3</p>
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Sample Test 2005 8<sup>th</sup> grade

Noel and Renaldo want to rent bikes with two other friends. They have \$150 to spend on bike rentals. The sign below shows the bike rental rates.

**Bike Rentals**

- Rent 1 bike for \$9.75 per hour.

**Special Group Rate**

- For groups of 4 or more, save \$3.00 per person.

All rates include tax.

Based on the information on the sign, the equation below can be used to determine the number of hours,  $h$ , the 4 friends can rent bikes with \$150.

$$4(9.75h - 3) = 150$$

Part A

Noel says they have enough money to rent the bikes for a maximum of 3 hours. Solve the equation for the number of hours,  $h$ , in order to determine whether Noel is correct. Show your work.

Sample Test 2005 8<sup>th</sup> grade

Juanita solved an equation incorrectly, as shown below.

$$3x + 6 = 24$$

$$3x/3 + 6 = 24/3$$

$$x + 6 = 8$$

$$x = 2$$

Part A

On the lines below, explain in words the mistake Juanita made.

Part B

Solve the equation

$$3x + 6 = 24$$

correctly.

Show your work.

Test 2006 at Grade 8

Match not verified

Solve for  $x$  in the equation below.

$$8(2x - 3) = -16$$

Show your work.

	<p>Test 2006 at Grade 8 Match not verified Omar wants to solve the equation <math>3x - 2 = 10</math>. Which steps could Omar follow to find the solution?</p> <ol style="list-style-type: none"> <li>Add 2 to both sides. Then divide both sides by 3</li> <li>Divide both sides by 3. Then add 2 to both sides.</li> <li>Subtract 2 from both sides. Then divide both sides by 3</li> <li>Multiply both sides by 3. Then subtract 2 from both sides.</li> </ol> <p>Test 2006 at Grade 8 Match not verified Solve for x in the equation below. <math>2(3x - 4) - 7 = 3x + 1 + x</math> Show your work. On the lines below, explain how to use the distributive property to help you solve this equation.</p> <p>Test 2006 at Grade 8 Match not verified Solve for y in the equation below. <math>-2y + 11 = -6y + 35</math> Show your work.</p>	
7.A.5	Solve one-step inequalities (positive coefficients only) and graph the solution set on a number line.	<p>Supplement</p> <p>CMP2 <i>The Shapes of Algebra</i> 2.2, 2.3</p>
7.A.6	Evaluate formulas for given input values (surface area, rate, and density problems.)	<p>CMP <i>Filling and Wrapping</i> Inv. 2, 3, 4, 5 <i>Variables and Patterns</i> 4.1, 4.2 and ACE 6 from Inv. 5 <i>Comparing and Scaling</i> Inv. 4</p> <p>CMP2 <i>Filling and</i></p>

		<i>Wrapping</i> Inv. 2, 3, 4
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Students will recognize, use and represent algebraically patterns, relations, and functions.

7.A.7	<b>Draw the graphic representation of a pattern from an equation or from a table of data. (Post-March)</b>	CMP <i>Variables and Patterns</i> 3.1, 4.1, 4.2,																								
7.A.8	<b>Create algebraic patterns using charts/tables, graphs, equations, and expressions. (Post-March)</b>	CMP <i>Variables and Patterns</i> , throughout <i>Looking for Pythagoras</i> , 3.1																								
7.A.9	<b>Build a pattern to develop a rule for determining the sum of the interior angles of polygons. (Post-March)</b>	CMP <i>Shapes and Designs</i> , Inv. 4																								
7.A.10	<b>Write an equation to represent a function from a table of values. (Post-March)</b>  Sample Test 2005 8 <sup>th</sup> grade The function table below follows a function rule. <table border="1"><tr><td>X</td><td>Y</td></tr><tr><td>0.5</td><td>2</td></tr><tr><td>1</td><td>1</td></tr><tr><td>2</td><td>0.5</td></tr><tr><td>4</td><td>0.25</td></tr><tr><td>5</td><td></td></tr><tr><td>10</td><td></td></tr></table> Part A Complete the table by filling in the two missing numbers. Part B Based on the table, write a function rule that represents the relationship between x and y.  Test 2006 at Grade 8 Match not verified. The table below shows a relationship between x and y. <table border="1"><tr><td>x</td><td>2</td><td>5</td><td>6</td><td>9</td></tr><tr><td>y</td><td>6</td><td>9</td><td>10</td><td>13</td></tr></table> Which equation shows the relationship between x and y? a. $y = 3x$ b. $x = 3y$	X	Y	0.5	2	1	1	2	0.5	4	0.25	5		10		x	2	5	6	9	y	6	9	10	13	CMP <i>Variables and Patterns</i> 4.3 and ACE 3, 4, 7 from Inv. 5 <i>Moving Straight Ahead</i>  <i>Say It With Symbols</i> 1.1, 1.2
X	Y																									
0.5	2																									
1	1																									
2	0.5																									
4	0.25																									
5																										
10																										
x	2	5	6	9																						
y	6	9	10	13																						

c.  $y = x + 4$

d.  $x = y + 4$

Sample Test 2005 8<sup>th</sup> grade

Luisa works in her grandfather's jewelry shop. She deposits her earnings in a savings account. Her savings account balances for five of the last six weeks are shown in the function table below.

Week (w)	Savings Balance (b)
1	\$510
2	\$620
3	\$730
4	\$840
5	?
6	\$1,060

Part A

According to the data in the function table, write a function rule that shows how much money Luisa saves each week.

Part B

Based on the table, how much money is in Luisa's savings account in week 5?

Test 2006 at Grade 8

Mr. Patel filled a swimming pool with water. When he started, the pool already contained 1,500 gallons. The table below shows the number of gallons of water in the pool after filling it for  $h$  hours.

Gallons of water in pool (g)	Number of hours (h)
1,500	0
2,100	1
2,700	2
3,300	3
3,900	4

Which equation can be used to determine the number of gallons,  $g$ , of water in the pool after  $h$  hours?

- a.  $g = 600h$
- b.  $g = 1,500h$
- c.  $g = 1,500 + 600h$
- d.  $g = 1,500h + 600$

Test 2006 at Grade 8

Match not verified.

Carlotta conducted an experiment on the growth rate of bacteria. The table below shows her results.

Number of hours (h)	Number of Bacteria (b)
0	20
1	56
2	92
3	128

Write a function rule for the number of bacteria,  $b$ , after  $h$  hours.

What will the number of bacteria be after 5 hours?

Test 2006 at Grade 8

Match not verified

Complete the function table below with the missing values for  $y$ .

$x$	1	2	3	4	5	6
$y$	3	7	11	15		

Based on the function table, write a function rule that shows the relationship between  $x$  and  $y$ .

## Geometry Strand

### Characteristics and properties of geometric shapes.

7.G.1	<p>Calculate the radius or diameter, given the circumference or area of a circle.</p> <p>Sample Test 2005 Kevin designs a sprinkler system for his yard. One rotation of the sprinkler waters a circle with an area of <math>225\pi</math> square feet. What is the radius, <math>r</math>, of the circle the rotating sprinkler waters? (Illustration of a circle with radius, <math>r</math>.)  <math display="block">A = \pi \times r^2</math> <ul style="list-style-type: none"> <li>a. 15 feet</li> <li>b. 25 feet</li> <li>c. 30 feet</li> <li>d. 47 feet</li> </ul> </p> <p>Test 2006 (Match not verified.) The circumference of the circle below is 25.12 centimeters. (Illustration of circle with radius drawn and labeled radius.)  <math display="block">C = 2 \pi r</math> <p>Which is the best estimate for the length of the radius of the circle?</p> <ul style="list-style-type: none"> <li>a. 3 centimeters</li> <li>b. 4 centimeters</li> <li>c. 8 centimeters</li> <li>d. 26 centimeters</li> </ul> </p> <p>Test 2006 (Match not verified.) A circle has a circumference that measures 18 <math>\pi</math> inches. What is the radius, in inches, of the circle?  <math display="block">C = 2 \pi r</math> <ul style="list-style-type: none"> <li>a. 6</li> <li>b. 9</li> <li>c. 18</li> <li>d. 36</li> </ul> </p>	<p>CMP <i>Covering and Surrounding</i> 7.2 Follow-up (6<sup>th</sup> grade unit)</p> <p>CMP2 <i>Covering and Surrounding</i> 5.2 (6<sup>th</sup> grade unit)</p>
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7.G.2	<p>Calculate the volume of prisms and cylinders, using a given formula and a calculator.</p> <p>Sample Test 2005 Mary wants to cover the bottom and outside of a can with material to make a pencil holder. She needs to know the surface area of the outside of the can. (Illustration of cylinder with radius of 4 cm and height of 9 cm) Part A Calculate the surface area, in square centimeters, of the outside of Mary's pencil holder using the formula <math>\pi r^2 + 2\pi rh</math>. Round your answer to the nearest tenth. <b>Show your work.</b> Part B On the lines below explain why the formula <math>\pi r^2 + 2\pi rh</math> is used to find the surface area of Mary's pencil holder instead of <math>2\pi r^2 + 2\pi rh</math>.</p> <p>Test 2006 (Match not verified.) Joel draws a picture of his cylinder shown below. (Illustration of cylinder with radius of 7 cm and height of 15 cm.) Calculate the volume of Joel's cylinder. Round your answer to the nearest tenth. Show your work.</p>	<p>CMP <i>Filling and Wrapping</i> 2.1, 4.1 CMP2 <i>Filling and Wrapping</i> 2.1, 3.3</p>
7.G.3	<p>Identify the two-dimensional shapes that make up the faces and bases of three-dimensional shapes (prisms, cylinders, cones, and pyramids).</p> <p>Sample Test 2005 A pyramid is shown below. (Illustration of a square pyramid)</p> <p>What shape is the base of the pyramid?</p> <ol style="list-style-type: none"> <li>pentagon</li> <li>square</li> <li>triangle</li> <li>trapezoid</li> </ol>	<p>CMP <i>Filling and Wrapping</i> 3.3 (prisms) 4.2 (cylinder) Inv. 5, ACE 12 (pyramid) CMP2 <i>Filling and Wrapping</i> 3.3 (cylinders, prisms) Inv. 4 ACE 35 (pyramids)</p>

	<p>Test 2006 (Match not verified.) What is the shape of each base of a cylinder?</p> <ol style="list-style-type: none"> <li>circle</li> <li>rectangle</li> <li>triangle</li> <li>square</li> </ol> <p>Test 2006 (Match not verified.) Richard's tent is a triangular prism, as shown below. (Illustration of tent) Which combination of shapes makes up the bases and faces of Richard's tent?</p> <ol style="list-style-type: none"> <li>2 triangles, 2 rectangles</li> <li>2 triangles, 3 rectangles</li> <li>3 triangles, 2 rectangles</li> <li>3 triangles, 3 rectangles</li> </ol> <p>Test 2006 (Match not verified.) A rectangular pyramid is shown below. (Illustration of rectangular pyramid) Which combination of shapes makes up the bases and faces of the rectangular pyramid?</p> <ol style="list-style-type: none"> <li>Picture of 3 triangles, 2 square</li> <li>Picture of 1 square 4 triangles</li> <li>Picture of 4 triangles</li> <li>Picture of 5 squares</li> </ol>	
7.G.4	<p>Determine the surface area of prisms and cylinders, using a calculator and a variety of methods.</p> <p>Test 2006 (Match not verified.) Rashid needs to buy some wood to build a box. He must calculate the surface area of the box to determine how much wood to buy. A diagram of the box is shown below. (Illustration of rectangular prism with height of 2 feet, width of 3 feet, length of 3 feet) How much wood does Rashid need to buy to build the box? Show your work</p>	<p>CMP <i>Filling and Wrapping</i> 2.1, 2.2, 3.3, 4.2 CMP2 <i>Filling and Wrapping</i> 2.1, 3.3</p>

**Students will identify and justify geometric relationships, formally and informally.**

7.G.5	<b>Identify the right angle, hypotenuse, and legs of a right triangle. (Post-March)</b>	CMP <i>Looking for</i> <i>Pythagoras</i> 3.1 CMP2 <i>Looking for</i> <i>Pythagoras</i> 3.1
7.G.6	<b>Explore the relationship between the lengths of the three sides of a right triangle to develop the Pythagorean Theorem. (Post-March)</b>	CMP <i>Looking for</i> <i>Pythagoras</i> 3.1, 3.2 CMP2 <i>Looking for</i> <i>Pythagoras</i> 3.1, 3.2
7.G.7	Find a missing angle when given angles of a quadrilateral.	Supplement when teaching 7.A.9. Content found in Shapes and Designs, Inv. 4
7.G.8	<b>Use the Pythagorean Theorem to determine the unknown length of a side of a right triangle. (Post-March)</b>  Sample Test 2005 Item from 8 <sup>th</sup> grade test Jenna has a triangular garden, as shown in the diagram below. (Illustration is a right triangle with a base of m, a height of 5 feet, and a hypotenuse of 13 feet.) What is the length, in feet of side m? Show your work Test 2006 Match not verified What is the length of side x in the triangle below? Illustration of right triangle with legs of 2 and 5 and hypotenuse x. <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>Pythagorean Theorem</b>  <math>c^2 = a^2 + b^2</math> </div> a. 7 b. (sq. root) 7 c. 29 d. (sq. root) 29	<b>CMP</b> <i>Looking for</i> <i>Pythagoras</i> 6.1, 4.2, 4.3 CMP2 <i>Looking for</i> <i>Pythagoras</i> 4.1, 4.2, 4.3, 4.4

	<p>Test 2006 at Grade 8 Match not verified. Tyrone is building a skateboard ramp with a piece of plywood that is 8 feet long. He wants the height of the ramp to be 5 feet. (Illustration of right triangle with height of 5 feet and hypotenuse of 8 feet.) To make a strong ramp, the base must form a right angle with the back of the ramp. What will be the length of the base rounded to the nearest tenth of a foot? Show your work.</p>	
7.G.9	<p><b>Determine whether a given triangle is a right triangle by applying the Pythagorean Theorem and using a calculator. (Post-March)</b></p> <p>Test 2006 at Grade 8 Match not verified Pat drew the triangle below. (Illustration of triangle with sides 10 cm, 18 cm, 26 cm) Is Pat's triangle a right triangle? Use the Pythagorean theorem to prove whether his triangle is a right triangle. Show your work. On the lines below, explain why your answer is correct.</p>	<p>CMP <i>Looking for Pythagoras 3.4</i> CMP2 <i>Looking for Pythagoras 3.4</i></p>

**Measurement Strand**

Students will determine what can be measured and how, using appropriate methods and formulas.

7.M.1	<p><b>Calculate distance using a map scale. (Post-March)</b></p> <p>Sample Test 2005 8<sup>th</sup> grade A path on a treasure map is shown on the grid below. (Illustration shows straight path from A to B, another B to C, another C to X and a scale is provided showing 1 square represents 1 square mile.) Complete the table below to calculate the total length of the path.</p> <table border="1"><tr><td>Path Section</td><td>Length (in miles)</td></tr><tr><td>Length of AB</td><td></td></tr><tr><td>Length of BC</td><td></td></tr><tr><td>Length of CX</td><td></td></tr><tr><td>Total Path Length</td><td></td></tr></table> <p>Test 2006 at Grade 8 Use your ruler to help you solve this problem. Roberta and her family drove from Tuscon to the Grand Canyon. The scale map below shows the route they took and distance they drove. <b>About</b> how many miles did Roberta and her family drive from Tucson to Phoenix. (Map is provide with a scale of 1 inch = 100 miles)</p> <ul style="list-style-type: none"><li>a. 75</li><li>b. 100</li><li>c. 125</li><li>d. 150</li></ul> <p>Test 2006 at Grade 8 Match not verified. Use your ruler to help you solve this problem. A kangaroo named Skippy travels from Sydney to Brisbane. Based on the scale drawing below, what is the distance, in miles, Skippy travels? Illustration of map with scale of ½ in. = 150 miles. Show your work.</p>	Path Section	Length (in miles)	Length of AB		Length of BC		Length of CX		Total Path Length		Supplement/Comparing and Scaling, Stretching and Shrinking
Path Section	Length (in miles)											
Length of AB												
Length of BC												
Length of CX												
Total Path Length												

7.M.2	<p>Convert capacities and volumes within a given system.</p> <p>Sample Test 2005 How many milliliters are equal to 0.7 liters?  <div>1 liter = 1,000 milliliters</div> <ul style="list-style-type: none"> <li>a. 0.007</li> <li>b. 0.07</li> <li>c. 70</li> <li>d. 700</li> </ul> </p> <p>Test 2006 (Match not verified.) Jose fills his fish tank with water. The tank holds 250 liters of water. How many milliliters does the tank hold?  <div>1 liter = 1,000 milliliters</div> <ul style="list-style-type: none"> <li>a. 25</li> <li>b. 2,500</li> <li>c. 25,000</li> <li>d. 250,000</li> </ul> </p> <p>Test 2006 (Match not verified.) Jennifer makes fruit punch for her family. She prepares a total of two gallons of fruit punch. How many cups of fruit punch does she make?  <div>1 gallon = 4 quarts 1 quart = 2 pints 1 pint = 2 cups</div> <ul style="list-style-type: none"> <li>a. 8</li> <li>b. 12</li> <li>c. 16</li> <li>d. 32</li> </ul> </p>	Supplement
7.M.3	<p>Identify customary and metric units of mass.</p> <p>Sample Test 2005 Which of the following is a metric unit for measuring mass?  <ul style="list-style-type: none"> <li>a. meter</li> <li>b. liter</li> <li>c. pound</li> <li>d. gram</li> </ul> </p>	Supplement

	<p>Test 2006 (Match not verified.) Which unit of measure is a metric unit for mass?</p> <ul style="list-style-type: none"> <li>a. centimeters</li> <li>b. meters</li> <li>c. kilometers</li> <li>d. grams</li> </ul>	
7.M.4	<p>Convert mass within a given system</p> <p>Sample Test 2005 How many pounds is 24 ounces?</p> <div style="border: 1px solid black; padding: 2px; margin-bottom: 10px;">1 pound = 16 ounces</div> <ul style="list-style-type: none"> <li>a. 1</li> <li>b. 1.5</li> <li>c. 2</li> <li>d. 2.5</li> </ul> <p>Test 2006 (Match not verified.) Ellen buys 24 ounces of green beans at the grocery store. The green beans cost \$1.90 per pound. How much does she pay for the green beans, before tax?</p> <div style="border: 1px solid black; padding: 2px; margin-bottom: 10px;">1 pound = 16 ounces</div> <ul style="list-style-type: none"> <li>a. \$1.90</li> <li>b. \$2.53</li> <li>c. \$2.85</li> <li>d. \$3.80</li> </ul> <p>Test 2006 (Match not verified.) Sunshine Airline requires each suitcase to weigh 31.75 kilograms or less before it can go onto the airplane. Trisha's suitcase weighs 3,620 grams before it is packed. What is the maximum amount of weight, in kilograms, Trisha can pack in her suitcase and still be allowed to bring her suitcase onto the airplane? Show your work</p>	<p>CMP2 <i>Filling and Wrapping</i> Inv. 5, ACE 16, 20, 22, 23 Supplement:</p>

7.M.5	<p><b>Calculate unit price using proportions. (Post-March)</b></p> <p>Sample Test 2005 8<sup>th</sup> grade Brian and Steve want to compare the prices of their favorite cereals to determine which is less expensive. The table below shows the price of each box of cereal and the number of ounces in each box.</p> <table><tr><td></td><td>Total weight (in oz)</td><td>Total Price (per box)</td><td>Price (per oz)</td></tr><tr><td>Brian's cereal</td><td>24 oz</td><td>\$3.84</td><td></td></tr><tr><td>Steve's cereal</td><td>32 oz</td><td>\$4.48</td><td></td></tr></table> <p>Part A Complete the table above by calculating the price per ounce of each kind of cereal.</p> <p>Part B Whose cereal is less expensive per ounce?</p> <p>Test 2006 Match not verified Jenny's Gift Shop sells candles in a variety of packages. The cost per candle is the same in every package. A package of 8 candles costs \$12.96. Write a proportion that can be used to determine the cost of a package of 3 candles. Proportion _____ Solve your proportion to determine the cost of a package of 3 candles. Show your work.</p>		Total weight (in oz)	Total Price (per box)	Price (per oz)	Brian's cereal	24 oz	\$3.84		Steve's cereal	32 oz	\$4.48		Comparing and Scaling, Inv. 4
	Total weight (in oz)	Total Price (per box)	Price (per oz)											
Brian's cereal	24 oz	\$3.84												
Steve's cereal	32 oz	\$4.48												



7.M.6	<p><b>Compare unit prices. (Post-March)</b></p> <p>Test 2006 at Grade 8 Match not verified The table below shows the prices of three different-sized packages containing the same type of candy.</p> <table><tr><td>Pkg</td><td>Wt In oz</td><td>Pkg Price</td><td>Candy Per oz</td></tr><tr><td>A</td><td>8</td><td>\$1.60</td><td></td></tr><tr><td>B</td><td>10</td><td>\$1.80</td><td></td></tr><tr><td>C</td><td>12</td><td>\$2.04</td><td></td></tr></table> <p>Complete the table to determine which package has the lowest candy price, per ounce. Show your work. Answer: _____</p>	Pkg	Wt In oz	Pkg Price	Candy Per oz	A	8	\$1.60		B	10	\$1.80		C	12	\$2.04		Comparing and Scaling, Inv. 4
Pkg	Wt In oz	Pkg Price	Candy Per oz															
A	8	\$1.60																
B	10	\$1.80																
C	12	\$2.04																
7.M.7	<p><b>Convert money between different currencies with the use of an exchange rate table and a calculator. (Post-March)</b></p>	Supplement																
7.M.8	<p>Draw central angles in a given circle using a protractor (circle graphs).</p>	Supplement																
7.M.9	<p>Determine the tool and technique to measure with an appropriate level of precision: mass.</p> <p>Sample Test 2005 Which tool and technique is used to measure the surface area of an object?</p> <ul style="list-style-type: none"><li>a. (Illustration of ruler) measure the sides of an object</li><li>b. (illustration of balance scale) compare the object to an object whose weight is already known</li><li>c. (illustration of measuring cup) put the object in a cup of water to see how much water it displaces</li><li>d. (illustration of scale) find the weight of the object</li></ul>	Supplement																

**Students will develop strategies for estimating measurements.**

7.M.10	Identify the relationships between relative error and magnitude when dealing with large numbers (i.e., money, population).	Supplement
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7.M.11	<p>Estimate surface area.</p> <p>Sample Test 2005 Keisha wants to paint the entire outside of her rectangular storage box shown in the diagram below. (Illustration of rectangular prism with length 12.6 inches, width 6.3 inches, height 4.2 inches) Use <b>estimation</b> to calculate the total surface area, in square inches, of the storage box. <b>Show your work.</b></p>	CMP Filling and Wrapping, Inv. 6
7.M.12	Determine personal references for customary/metric units of mass.	Supplement
7.M.13	Justify the reasonableness of the mass of an object.	Throughout

### ***Statistics and Probability Strand***

Students will collect, organize, display and analyze data.

7.S.1	Identify and collect data using a variety of methods.	Throughout
7.S.2	<p>Display data in a circle graph.</p> <p>Sample Test 2005 A pet store owner surveys 20 customers to determine what types of pets they own. The survey results are shown in the table below. (Illustration of table with column for Pet and column for number owned shown with tally marks: dog 10, cat 5, fish 3, none 2) Which circle graph best represents the data in the table?</p> <ol style="list-style-type: none"> <li>circle divided into fourths with labels of none, dog, cat, fish.</li> <li>Circle giving dog <math>\frac{1}{2}</math>, cat <math>\frac{1}{4}</math>, fish and none sharing <math>\frac{1}{4}</math> with fish getting larger part than none.</li> <li>Circle giving dog <math>\frac{1}{3}</math>, cat <math>\frac{1}{3}</math>, fish and none sharing remaining <math>\frac{1}{3}</math> with fish getting a larger share.</li> <li>Circle giving dog <math>\frac{1}{2}</math>, cat fish and none <math>\frac{1}{6}</math> each.</li> </ol>	<p>Supplement</p> <p>CMP2 <i>Data Distributions</i> ACE 16 in Inv.2, ACE 14-16 and 26-29 in Inv. 3, ACE 8 in Inv. 4</p>

7.S.3	<p>Convert raw data into double bar graphs and double line graphs.</p> <p>Sample Test 2005 The Roosevelt Middle School band has monthly fundraisers. The table below shows the amount of money the band raises and their fundraising expenses each month for four months.</p> <table border="1"> <thead> <tr> <th>Month</th><th>Amount raised</th><th>Expense s</th></tr> </thead> <tbody> <tr> <td>Sep</td><td>\$125</td><td>\$ 50</td></tr> <tr> <td>Oct</td><td>\$275</td><td>\$ 75</td></tr> <tr> <td>Nov</td><td>\$450</td><td>\$125</td></tr> <tr> <td>Dec</td><td>\$100</td><td>\$ 25</td></tr> </tbody> </table> <p>Based on the data in the table, create a double-bar graph on the grid below to show the amount of money the band raises and the fundraising expenses for each month. Be sure to</p> <ul style="list-style-type: none"> <li>• Title the graph</li> <li>• Label the axes</li> <li>• Graph all the data</li> <li>• Provide an appropriate key for the graph (Grid is provided)</li> </ul>	Month	Amount raised	Expense s	Sep	\$125	\$ 50	Oct	\$275	\$ 75	Nov	\$450	\$125	Dec	\$100	\$ 25	<p>CMP <i>Samples and Populations</i> 1.1 <i>Moving Straight Ahead</i> 2.1, 2.2, 2.3, 2.4</p>
Month	Amount raised	Expense s															
Sep	\$125	\$ 50															
Oct	\$275	\$ 75															
Nov	\$450	\$125															
Dec	\$100	\$ 25															
7.S.4	<p>Calculate the range for a given set of data.</p> <p>Sample Test 2005 Jacob received the following scores on his last five science tests. 81, 73, 80, 94, 97 What is the range of Jacob's scores for these five science tests?</p> <ol style="list-style-type: none"> <li>16</li> <li>24</li> <li>81</li> <li>85</li> </ol> <p>Test 2006 (Match not verified.) Lavonda learned to ride a unicycle. She practiced riding the unicycle for 25 minutes Monday, 20 minutes on Tuesday, 22 minutes on Wednesday, 31 minutes on Thursday, and 13 minutes on Friday. What is the range for the data?</p> <ol style="list-style-type: none"> <li>5 minutes</li> <li>12 minutes</li> <li>21 minutes</li> </ol>	<p>CMP <i>Data About Us</i> (Likely learned in 6<sup>th</sup> along with mean, median, and mode)</p> <p>CMP2 <i>Data Distributions</i> Throughout unit</p>															

	d. 31 minutes e.	
7.S.5	Select the appropriate measure of central tendency.	<p>CMP <i>Data About Us</i> (Likely learned in 6<sup>th</sup> grade with mean, median, mode and range)</p> <p>CMP2 <i>Data Distributions</i> Inv. 2 (thoroughly developed)</p>
7.S.6	<p>Read and interpret data represented graphically (pictograph, bar graph, histogram, line graph, double line/bar graphs or circle graph).</p> <p>Sample Test 2005 The pictograph below records Vista Sunglass sales for 2004. (Illustration is pictograph with each pair of sunglasses representing 10,000 pairs showing brown 2 pairs, yellow 6 pairs, green 3 pairs, gray 4 pairs) Which color of lens had sales three times greater than one of the other color of lens?</p> <p>a. brown b. yellow c. green d. gray</p>	<p>Throughout <i>Data About Us</i> (6<sup>th</sup>) <i>Variables and Patterns</i> (7<sup>th</sup>) <i>Moving Straight Ahead</i> (7<sup>th</sup>) <i>Samples and Populations</i> 1.1</p>

Test 2006

(Match not verified.)

The line graph below shows the growth of Terrell's tomato plant for 10 days. (Illustration of a line segment showing height of 2.5 cm on day 1, with constant rate of growth of 2.5 cm per day stopping on Day 10 at 25 cm.)

How tall was the tomato plant on day 7?

- 3 centimeters
- 12.5 centimeters
- 17.5 centimeters

20 centimeters Test 2006

(Match not verified.)

The table below shows the lowest recorded temperatures, in degrees Fahrenheit in New York each month for four months.

Low Temperatures

Month	Temperature ( <sup>0</sup> F)
January	10
February	-16
March	24
April	38

Which line graph correctly displays the data?

a. b. c. d are four line graphs, 1 of which is correct.

**Students will make predictions that are based upon data analysis.**

7.S.7	Identify and explain misleading statistics and graphs.	CMP <i>Samples and Populations</i> Inv. 4 ACE 5-11
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**Students will understand and apply concepts of probability.**

7.S.8	<p>Interpret data to provide the basis for predictions and to establish experimental probabilities.</p> <p>Sample Test 2005</p> <p>Derek conducts a probability experiment for his mathematics class. He uses the ten cards shown below. (Illustration: Cards 1, 2, 3 are black. Cards 4, 5, 6, 7 are white, Cards 8,9,10 are gray.)</p> <p>Derek randomly picks one of the ten cards from a container, looks at the color and replaces the card. He repeats this 100 times. How many times would you expect Derek to pick a white card?</p> <ul style="list-style-type: none"><li>a. 20 times</li><li>b. 30 times</li><li>c. 40 times</li><li>d. 50 times</li></ul> <p>Sample Test 2005</p> <p>Dylan has a bag containing 15 marbles. The table below shows the number of marbles of each color in the bag. As part of a probability experiment for his science class, Dylan randomly picks a marble from the bag and then replaces it. He repeats this 300 times.</p> <table><tr><th>Marble Color</th><th>Number of marbles</th></tr><tr><td>White</td><td>3</td></tr><tr><td>Red</td><td>8</td></tr><tr><td>Blue</td><td>3</td></tr><tr><td>Black</td><td>1</td></tr></table> <p>Part A</p> <p>Dylan randomly picks a marble from the bag. What is the probability the marble will be red?</p> <p><b>Show your work.</b></p> <p>Part B.</p> <p>Predict the number of times out of 300 Dylan will pick a red marble.</p>	Marble Color	Number of marbles	White	3	Red	8	Blue	3	Black	1	<p>CMP</p> <p><i>What Do You Expect?</i></p> <p>Problems</p> <p>Selected by Teacher</p> <p>CMP2</p> <p><i>What Do You Expect?</i></p> <p>Problems</p> <p>Selected by Teacher</p>
Marble Color	Number of marbles											
White	3											
Red	8											
Blue	3											
Black	1											

	<p><b>Show your work.</b></p> <p>Test 2006 (Match not verified.) The table below shows the attendance at a skating rink during the first 4 months of this year.</p> <table><tr><td>Month</td><td>Number of People</td></tr><tr><td>January</td><td>1,450</td></tr><tr><td>February</td><td>1,502</td></tr><tr><td>March</td><td>1,631</td></tr><tr><td>April</td><td>1,688</td></tr><tr><td>May</td><td>?</td></tr></table> <p>Based on the data in the table, which is the best prediction for how many people skated at the skating rink in May?</p> <p>a. 1,400 b. 1,600 c. 1,800 d. 2,000</p>	Month	Number of People	January	1,450	February	1,502	March	1,631	April	1,688	May	?	
Month	Number of People													
January	1,450													
February	1,502													
March	1,631													
April	1,688													
May	?													
7.S.9	<p>Determine the validity of sampling methods to predict outcomes.</p> <p>Test 2006 (Match not verified.) Karen surveyed students in one middle school about their favorite band. Of the 1,156 students in the middle school, 65 sixth-grade students were surveyed. More than half of the 65 students said their favorite band is Rhonda and the Gees. Based on the survey, Karen says most middle school students' favorite band is Rhonda and the Gees. Why is Karen's statement incorrect?</p> <p>a. Karen surveyed too many students. b. Karen's survey sample was too small. c. Karen did not survey any high school students.</p> <p>Karen did not include enough bands in the survey?</p>	<p>CMP <i>Samples and Populations,</i> 2.1, 2.2, 2.3 3.1, 3.2, 3.3</p>												
7.S.10	<p>Predict the outcome of experiments.</p> <p>Sample Test 2005 A spinner is divided into five equal sections numbered 1 through 5. Predict how many times out of 240 spins the spinner is most likely to stop on an odd number.</p> <p>a. 80 b. 96 c. 144 d. 192</p>	<p>CMP <i>What Do You Expect?</i> Problems Selected by Teacher</p> <p>CMP2 <i>What Do You Expect?</i> Problems Selected by</p>												

		Teacher
7.S.11	Design and conduct an experiment to test predictions.	<p>CMP <i>What Do You Expect?</i> Problems Selected by Teacher</p> <p>CMP2 <i>What Do You Expect?</i> Problems Selected by Teacher</p>
7.S.12	Compare actual results to predicted results.	<p>CMP <i>What Do You Expect?</i> Problems Selected by Teacher</p> <p>CMP2 <i>What Do You Expect?</i> Problems Selected by Teacher</p>

Post-March 6<sup>th</sup> grade PI's on 7<sup>th</sup> grade test, 2006

6.A.3 Translate two-step verbal sentences into algebraic equations.

Marcus buys three notebooks for school. Each notebook is the same price. Marcus uses a coupon that is worth \$2 off his total purchase. He pays a total of \$7 with the coupon. Which equation can be used to find the cost of one notebook,  $n$ ?

- a.  $3n - 2 = 7$
- b.  $3n + 2 = 7$
- c.  $3(n - 2) = 7$
- d.  $3(n + 2) = 7$

6.S.11 Determine the number of possible outcomes for a compound event by using the fundamental counting principle and use this to determine the probabilities of events when the outcomes have equal probability.

Heather stands in the lunch line at school. For her meal, she can choose spaghetti or pizza. She can also have apple juice, orange juice, or milk. How many different combinations of one meal and one drink can Heather choose?



- a. 2
- b. 3
- c. 5
- d. 6

6.S.9 List possible outcomes for compound events.

Keisha has one penny, one nickel, and one dime in her pocket. She randomly takes one coin out of her pocket. Without putting it back, she randomly takes out another coin. If Keisha lists all the possible outcomes of picking the two coins one at a time, how many outcomes are there?

- a. 2
- b. 3
- c. 4
- d. 6

6.S.4 Determine and justify the most appropriate graph to display a given set of data (pictograph, bar graph, line graph, histogram, or circle graph)

Test 2006 (Grade 7)

Match not verified

Tyler surveys his classmates to determine the number and type of pets they have. The frequency table below shows this data.

Type of Pet	Number
Fish	9 (tally marks)
Hamster	3
Cat	7
Dog	6

Based on the data, which type of graph is **best** to display Tyler's data?

On the lines below, explain why the graph you chose is best to display Tyler's data

6.S.3 Construct Venn diagrams to sort data.

Test 2006 at Grade 7

Match not verified

The list below shows the number of students who participate in football and track at Farrell Middle School.

- A total of 33 students participate in football.
- A total of 24 students participate in track.
- There are 8 students who participate in both sports.

Part A

Use the list above to complete the Venn diagram in the space below.

Be sure to

- Title the diagram
- Label each circle
- Place a number in each section of the diagram

(Illustration shows two circles intersecting.)

Part B.

What is the total number of students who participate in these sports?

## Accentuate the Negative

(Pre-March)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
1.3	7.N.1 Distinguish between the various subsets of real numbers (counting/natural numbers, whole numbers, integers, rational numbers, and irrational numbers).	
2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4	7.N.12 Add, subtract, multiply and divide integers. 7.N.13 Add and subtract two integers (with and without the use of a number line).	

## Prime Time

(Pre-March)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
Inv. 4, 5	7.N.8 Find the common factors and greatest common factor of two or more numbers. 7.N.9 Determine multiples and least common multiples of two or more numbers. 7.N.10 Determine the prime factorization of a given number and write in exponential form.	

## Data Around Us

Pre-March)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
4.3	7.N.5 Write numbers in scientific notation. 7.N.6 Translate numbers from scientific notation into standard form. 7.N.7 Compare numbers in scientific notation.	Supplement 7.N.14 Develop a conceptual understanding of negative and zero exponents with a base of ten and relate to fractions and decimals. Supplement 7.N.4 Develop the laws of exponents for multiplication and division.

## Variables and Patterns

(Pre-March)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
3.1	7.A.7 Draw the graphic representation of a pattern from an equation or from a table of data.	
4.1, 4.2 and ACE 6, Inv. 5	7.A.6 Evaluate formulas for given input values (surface area, rate, and density) 7.A.7 Draw the graphic representation of a pattern from an equation or from a table of data.	
4.3 and ACE 3, 4, 7 Inv. 5	7.A.1 Translate two-step verbal expressions into algebraic expressions. <b>7.A.10 Write an equation to represent a function from a table of values.</b>	

## Shapes and Designs

(7.A.9 is Post-March, 7.G.7 is Pre-March, Consider doing after Variables and Patterns.)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
Inv. 4	<b>7.A.9 Build a pattern to develop a rule for determining the sum of the interior angles of polygons. (Post-March)</b>	Supplement 7.G.7 (Find a missing angle when given angles of a quadrilateral.) Note 7.G.7 is Pre-March.

## What Do You Expect

(Pre-March)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
Problems chosen by teacher	7.S.8 Interpret data to provide the basis for predictions and to establish experimental probabilities. 7.S.10 Predict the outcome of experiment. 7.S.11 Design and conduct an experiment to test predictions. 7.S.12 Compare actual results to predicted results.	

## Filling and Wrapping

(Pre-March)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
2.1, 4.1	7.G.2 Calculate the volume of prisms and cylinders, using a given formula and a calculator.	Supplement 7.G.1 (Calculate the radius or diameter, given the circumference or area of a circle) when teaching cylinders. Content found in <i>Covering and Surrounding</i> , 7.2 Follow-up
3.3 (prisms) 4.2 (cylinder) Inv. 5, ACE 12 (pyramid)	7.G.3 Identify the two-dimensional shapes that make up the faces and bases of three-dimensional shapes (prisms, cylinders, cones, and pyramids).	
2.1, 2.2, 3.3, 4.2	7.G.4 Determine the surface area of prisms and cylinders, using a calculator and a variety of methods. 7.A.6 Evaluate formulas for given input values (surface area, rate, and density problems.)	
Inv. 6	7.M.11 Estimate surface area.	

## Develop Using Supplementary Materials

(Pre-March)

Source	New York Performance Indicator	Estimated Time/Notes
	7.M.2 Convert capacities and volumes within a given system.	
	7.M.3 Identify customary and metric units of mass	
	7.M.4 Convert mass within a given system.	
	7.M.9 Determine the tool and technique to measure with an appropriate	
	7.M.10 Identify the relationships between relative error and magnitude when dealing with large numbers (i.e., money, population).	

	7.M.12 Determine personal references for customary/metric units of mass.	
	7.M.13 Justify the reasonableness of the mass of an object.	

## Samples and Populations

(Pre-March)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
1.1, 1.2 (part)	7.S.3 Convert raw data into double bar graphs and double line graphs. 7.S.4 Calculate the range for a given set of data.	(Problem offers opportunity for choices based on prior knowledge.) (Range is included in five-number summary.)
2.1, 2.2, 2.3	7.S.9 Determine the validity of sampling methods to predict outcomes.	
3.1, 3.2, 3.3	7.S.9 Determine the validity of sampling methods to predict outcomes.	
Inv 4, ACE 5-11	7.S.7 Identify and explain misleading statistics and graphs.	

## Moving Straight Ahead

(Inv. 2, is Pre-March, Inv. 3 is Post-March)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
2.1, 2.2, 2.3, 2.4	7.S.3 Convert raw data into double bar graphs and double line graphs.	
3.1, 3.2, 3.3	<b>7.A.4 Solve multi-step equations by combining like terms, using the distributive property, or moving variables to one side of the equation.</b>	

# Looking for Pythagoras

(Begin Pre-March and complete Post-March)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
2.1, 2.2	<p>7.N.1 Distinguish between the various subsets of real numbers (counting/natural numbers, whole numbers, integers, rational numbers, and irrational numbers).</p> <p>7.N.2 Recognize the difference between rational and irrational numbers (i.e., explore different approximations of pi).</p> <p>7.N.15 Recognize and state the value of the square root of a perfect square (up to 225).</p> <p>7.N.16 Determine the square root of non-perfect squares using a calculator.</p> <p>7.N.18 Identify the two consecutive whole numbers between which the square root of a non-perfect square whole number less than 225 lies (with and without the use of a number line).</p>	
3.1	<p><b>7.G.5 Identify the right angle, hypotenuse, and legs of a right triangle. (Post-March)</b></p> <p><b>7.A.8 Create algebraic patterns using charts/tables, graphs, equations, and expressions. (Post-March)</b></p>	
5.1, 5.2, 5.3	<p>7.N.3 Place rational and irrational numbers (approximations) on a number line and justify the placement of the numbers.</p> <p>7.N.17 Classify irrational numbers as non-repeating/non-terminating decimals.</p>	

## Say It With Symbols

(Inv. 1 Pre-March, Inv. 2, 3, 4 Post-March)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
1.1, 1.2, 1.3	7.N.11 Simplify expressions using order of operations.	
2.1, 2.2	<b>7.A.2 Add and subtract monomials with exponents of one.</b>	<b>Supplement 7.A.3</b> <b>Identify a polynomial as an algebraic expression containing one or more terms.</b>
3.1, 3.2	<b>7.A.2 Add and subtract monomials with exponents of one.</b> <b>7.A.4 Solve multi-step equations by combining like terms, using the distributive property, or moving variables to one side of the equation.</b>	
4.1, 4.2, 4.3	<b>7.A.4 Solve multi-step equations by combining like terms, using the distributive property, or moving variables to one side of the equation.</b>	

## Comparing and Scaling

(Post-March)

Investigation/ Problem	New York Performance Indicator	Estimated Time/ACE/ Notes
Inv. 4	<b>7.A.6 Evaluate formulas for given input values (surface area, rate, and density)</b> <b>7.M.5 Calculate unit price using proportions.</b> <b>7.M.6 Calculate unit price.</b>	<b>Supplement 7.M.7</b> <b>Convert money between different currencies with the use of an exchange rate table and a calculator.</b> <b>Supplement 7.M.1</b> <b>Calculate distance using a map.</b>





# MSTP Document

## Prepared for MSTP Participants by Linda L. Walker

April, 2006

Grade Eight

### *Number Sense and Operations Strand*

Students will understand meanings of operations and procedures, and how they relate to one another.

8.N.1	<p>Develop and apply the laws of exponents for multiplication and division.</p> <p>Sample Test 2005 The Horseshoe Nebula is about <math>5.0 \times 10^3</math> light years away from Earth. One light year is equal to approximately <math>5.9 \times 10^{12}</math> miles. What is the approximate distance, in miles, between Earth and the Horseshoe Nebula?</p> <p>a. <math>2.95 \times 10^{16}</math> b. <math>2.95 \times 10^{36}</math> c. <math>10.9 \times 10^{15}</math> d. <math>10.9 \times 10^{36}</math></p>	<p>CMP Supplement</p> <p>CMP2 <i>Growing, Growing, Growing 5.2, 5.3</i></p>
8.N.2	<p>Evaluate expressions with integral exponents.</p> <p>Sample Test 2005 Simplify the expression below.</p> <p><math>4^3</math></p> <p>a. 7 b. 12 c. 43 d. 64</p>	<p>CMP <i>Growing, Growing, Growing All Investigations</i></p> <p>CMP2 <i>Growing, Growing, Growing All Investigations</i></p>
8.N.3	<p>Read, write, and identify percents less than 1% and greater than 100%.</p>	<p>Supplement</p>
8.N.4	<p>Apply percents to: Tax</p>	<p><i>Supplementary sources including</i></p>

<p>Percent increase/decrease Simple interest Sale price Commission Interest rates Gratuities Sample Test 2005 Tomas earns a 5% commission for each cellular phone he sells. On Tuesday, he sells a cellular phone for \$180. How much commission does Tomas earn on this sale?</p> <p>a. \$9 b. \$36 c. \$90 d. \$189</p> <p>Sample Test 2005 Xavier bought a shirt that was on sale for 20% off the original price. He also used a coupon that gave him an additional 15% off the sale price of the shirt. The original price of the shirt was \$37. What is the new price of the shirt before tax? <b>Show your work.</b></p> <p>Test 2006 Match not verified Tai went to a shopping mall. He spent \$25.75 on a shirt, \$15.49 on a hat, and \$9.95 on a poster, before tax. Tax was 8.25% on all purchases. What was the total cost of Tai's purchases, including tax? Show your work.</p> <p>Test 2006 Match not verified Ben wants to buy a guitar. The regular price of the guitar is \$329.99. The sale price of the guitar is 25% off of the regular price. Part a What is the sale price of the guitar? Show your work. Part B Ben must pay 7.25% sales tax in addition to the sale price of the guitar. What is the total amount Ben must pay for the guitar? Show your work.</p> <p>Test 2006 Match not verified</p>	<p>CMP <i>Bits and Pieces II</i> Inv. 1</p> <p>CMP2 <i>Bits and Pieces III</i> Inv. 4, 5</p>
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	<p>A pair of sandals is on sale for 20% off the original price. If the original price is \$16.00, what is the sale price?</p> <p>a. \$3.20 b. \$12.00 c. \$12.80 d. \$19.20</p>	
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**Students will compute accurately and make reasonable estimates.**

8.N.5	<p>Estimate a percent of quantity, given an application.</p> <p>Test 2006 Match not verified Heather saw the sign below advertising a sale at The Dress Place.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p><b>The Dress Place</b> All items 10% to 50% off</p> </div> <p>She has been saving money to buy a dress that regularly costs \$80. Heather's friend Sarah tells her she needs to have between \$40.00 and \$60.00 to buy the dress at the sale price. On the lines below, explain if Sarah's estimate is correct.</p> <p>Test 2006 Match not verified Jordan has \$608 in his savings account. He withdraws 15% of the money to purchase school clothes. Which is the <b>best</b> estimate for the amount of money Jordan withdraws?</p> <p>a. \$40 b. \$90 c. \$400 d. \$510</p> <p>Sample Test 2005 During the summer, Breanna works at a coffee shop. She saves 75% of her earnings to buy new school clothes. If Breanna earns \$750, what is the <b>best</b> estimate for the amount of money she saves to buy clothes?</p> <p>a. \$100 b. \$150 c. \$300 d. \$550</p> <p>Sample Test 2005 The table below shows the number of students who</p>	<p>Supplementary sources including: CMP <i>Bits and Pieces II</i>, Inv. 1 <i>Comparing and Scaling</i> 2.1, 2.2</p> <p>CMP2 <i>Bits and Pieces III</i> Inv. 4, 5</p>
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	<p>attended Walters Middle School each year during a five-year period.</p> <table><tr><th>Year</th><th>Number of Students</th></tr><tr><td>2000</td><td>511</td></tr><tr><td>2001</td><td>548</td></tr><tr><td>2002</td><td>587</td></tr><tr><td>2003</td><td>664</td></tr><tr><td>2004</td><td>705</td></tr></table> <p>What is the <b>approximate</b> percent increase in the number of students from 2000 to 2004?</p> <p>a. 50%</p> <p>a. 40%</p> <p>b. 30%</p> <p>c. 20%</p>	Year	Number of Students	2000	511	2001	548	2002	587	2003	664	2004	705	
Year	Number of Students													
2000	511													
2001	548													
2002	587													
2003	664													
2004	705													
8.N.6	Justify the reasonableness of answers using estimation.	Throughout												

### *Algebra Strand*

**Students will represent and analyze algebraically a wide variety of problem solving situations.**

8.A.1	<p>Translate verbal sentences into algebraic inequalities.</p> <p>Sample Test 2005 Hank sells toy cars on a web site. The web site fee is \$30. Hank sells each toy car for \$4. What inequality does Hank use to determine how many toy cars, <math>c</math>, he must sell to make a profit of <b>at least</b> \$50?</p> <ul style="list-style-type: none"> <li>a. <math>34c</math> (is less than or equal to) 50</li> <li>b. <math>34c</math> (is greater than or equal to) 50</li> <li>c. <math>4c + 30</math> (is less than or equal to) 50</li> <li>d. <math>4c - 30</math> (is greater than or equal to) 50</li> </ul> <p>Sample Test 2005 A number, <math>n</math>, divided by 2 is less than or equal to the product of <math>n</math> and 3. What inequality represents this relationship?</p> <ul style="list-style-type: none"> <li>a. <math>n/2</math> (is greater than or equal to) <math>3n</math></li> <li>b. <math>n/2</math> (is less than or equal to) <math>3n</math></li> <li>c. <math>n/2</math> (is greater than or equal to) <math>n + 3</math></li> <li>d. <math>n/2</math> (is less than or equal to) <math>n + 3</math></li> </ul> <p>Sample Test 2005 Linda must calculate the cost of filling her car's 12 gallon</p>	<p>CMP2 <i>The Shapes of Algebra 2.2, 2.3</i></p>
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	<p>gas tank. She calculates the difference between how much gasoline her gas tank will hold and the number of gallons of gas, <math>g</math>, already in the tank. Then she multiplies the difference by the price, <math>p</math>, of one gallon of gas. What expression does Linda use to calculate the cost to fill her gas tank?</p> <ol style="list-style-type: none"> <li><math>(12 - g)p</math></li> <li><math>gp - 12</math></li> <li><math>(g - p)12</math></li> <li><math>12p - g</math></li> </ol> <p>Sample Test 2005 Write an equation that represents “eight less than twice a number is forty-two.”</p> <p>Solve the equation. <b>Show your work.</b></p> <p>Test 2006 Match not verified The cost of one burrito, <math>b</math>, and one taco, <math>a</math>, is less than the cost of two burritos. Which inequality represents this relationship?</p> <ol style="list-style-type: none"> <li><math>b + a</math> (is less than) <math>2b</math></li> <li><math>b + a</math> (is less than) <math>b^2</math></li> <li><math>2b</math> (is less than) <math>b + a</math></li> <li><math>b^2</math> (is less than) <math>b + a</math></li> </ol> <p>Test 2006 Match not verified The sum of a number and its square is less than or equal to negative three. Which inequality represents this relationship?</p> <ol style="list-style-type: none"> <li><math>n(n^2)</math> (is less than) <math>-3</math></li> <li><math>n(n^2)</math> (Is less than or equal to) <math>-3</math></li> <li><math>n + n^2</math> (is less than) <math>-3</math></li> <li><math>n + n^2</math> (Is less than or equal to) <math>-3</math></li> </ol> <p>Test 2006 Match not verified</p>	
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	<p>Carol wants to earn at least \$150.00 for her charity while running a race. She will earn \$20 for participating plus \$7.00 for each mile she runs. If <math>m</math> represents the number of miles she runs, which inequality represents the money Carol wants to earn?</p> <ol style="list-style-type: none"> <li><math>7m + 20</math> (is less than or equal to) 150</li> <li><math>7m + 20</math> (is greater than or equal to) 150</li> <li><math>20m + 7</math> (is less than or equal to) 150</li> <li><math>20m + 7</math> (is greater than or equal to) 150</li> </ol>	
8.A.2	<p>Write verbal expressions that match given mathematical expressions.</p> <p>Sample Test 2005</p> <p>What word phrase is equivalent to the equation <math>y - 2x - 3</math>?</p> <ol style="list-style-type: none"> <li>The soccer coach is 3 years more than twice the age of his youngest team member.</li> <li>The soccer is 3 years less than twice the age of his youngest team member.</li> <li>The soccer coach is 2 years more than three times the age of his youngest team member.</li> <li>The soccer coach is 2 years less than three times the age of his youngest team member.</li> </ol>	Supplement
8.A.3	Describe a situation involving relationships that matches a given graph.	Variables and Patterns Inv. 1 ACE 4, 7; 2.3, Inv. 2, ACE 4, 11
8.A.4	Create a graph given a description or an expression for a situation involving a linear or nonlinear relationship.	<p>CMP</p> <p><i>Moving Straight Ahead</i> 2.2, 2.3, 2.5 and <i>Frogs, Fleas and Painted Cubes</i> 2.4</p> <p>CMP2</p> <p><i>Frogs, Fleas and Painted Cubes</i> 1.2 2.5</p> <p><i>The Shapes of Algebra</i>, Inv. 1, 2, 3</p>
8.A.5	Use physical models to perform operations with polynomials.	CMP <i>Frogs, Fleas, and</i>

		<i>Painted Cubes</i> 1.1, 2.1, 2.2,, 2.3 CMP2 <i>Frogs, Fleas and Painted Cubes</i> 1.2 1.1, 2.1, 2.2, 2.3, 2.4, 2.5
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**Students will perform algebraic procedures accurately.**

8.A.6	Multiply and divide monomials.  Test 2006 Match not verified Simplify the expression below. $\frac{24x^2y}{6xy^3}$  a. $18x^3y^4$ b. $4xy^2$ c. $4x/y^2$ d. $18x^2/y^2$	CMP <i>Frogs, Fleas, and Painted Cubes</i> 2.2, 2.3 CMP2 <i>Frogs, Fleas and Painted Cubes</i> 1.2 2.2, 2.3
8.A.7	Add and subtract polynomials (integer coefficients).  Sample Test 2005 Simplify the expression below.  $(3^2y - 5xy + 12xy^2) - (5xy^2 + 4xy)$ a. $10x^2y^2 - 9xy$ b. $20x^2y^2 - xy$ c. $3x^2y - xy + 17xy^2$ d. $3x^2y - 9xy + 7xy^2$  Sample Test 2005 Simplify the expression below.  $3a^2b + 6a^2b$  a. $9a^2b$ b. $9a^4b^2$ c. $18a^2b$ d. $18a^4b^2$  Sample Test 2005	CMP <i>Frogs, Fleas and Painted Cubes</i>  CMP2 <i>Frogs, Fleas and Painted Cubes</i> 12.3, 2.4  Supplement

	<p>Monisha is making a quilt following the pattern shown below.          (Illustration with two supplementary angles shown measuring <math>x</math> degrees and <math>3x + 20</math> degrees.)          If all the horizontal lines are parallel, what is the value of <math>x</math>?  <b>Show your work.</b></p> <p><b>Sample Test 2005</b>          Simplify the expression below.  <math>(3x^2 - 6x - 4) - (x^2 + 4x - 2)</math>          a. <math>2x^2 - 10x - 2</math>          b. <math>2x^2 - 2x - 6</math>          c. <math>3x^2 - 10x - 6</math>          d. <math>3x^2 + 10x + 2</math></p> <p>Test 2006          Match not verified          Simplify the expression below.  <math>(3x^2 - 2x - 1) + (-2x^2 + 4)</math>          a. <math>x^2 + 3</math>          b. <math>5x^2 + 3</math>          c. <math>x^2 - 2x + 3</math>          d. <math>5x^2 - 2x + 3</math></p>	
8.A.8	<p>Multiply a binomial by a monomial or a binomial (integer coefficients).</p> <p><b>Sample Test 2005</b>          Multiply the two binomials below.  <math>(2x - 3)(2x + 3)</math>          a. <math>4x^2 + 9</math>          b. <math>4x^2 - 9</math>          c. <math>4x^2 - 6x - 9</math>          d. <math>4x^2 - 12x + 9</math></p> <p><b>Sample Test 2005</b>          Multiply the expression below.  <math>(3x - 5)(2x - 8)</math>          a. <math>5x^2 + 3</math>          b. <math>6x^2 - 40</math>          c. <math>6x^2 + 34x + 40</math>          d. <math>6x^2 - 34x + 40</math></p> <p>Test 2006          Match not verified</p>	<p>CMP  <i>Frogs, Fleas, and Painted Cubes</i>          2.2, 2.3          CMP2  <i>Frogs, Fleas and Painted Cubes</i> 1.2          2.2, 2.3</p> <p>Supplement</p>



	<p>Multiply the expression below.</p> <p><math>-3x(x - 4)</math></p> <p>a. <math>-3x^2 - 4</math></p> <p>b. <math>-3x^2 - 7</math></p> <p>c. <math>-3x^2 - 12x</math></p> <p>d. <math>-3x^2 + 12x</math></p>	
8.A.9	<p>Divide a polynomial by a monomial (integer coefficients). Note: The degree of the denominator is less than or equal to the degree of the numerator for all variables.</p> <p>Sample Test 2005 Which expression is an equivalent form of <math>(2x^3 + 4x^2)/2x^2</math></p> <p>a. <math>x + 2</math></p> <p>b. <math>2x(x + 1)</math></p> <p>c. <math>2x^2(x + 1)</math></p> <p>d. <math>2x^2(x + 3)</math></p>	<p>CMP2 <i>Growing, Growing, Growing</i> 5.2 and supplement</p>
8.A.10	<p>Factor algebraic expressions using the GCF.</p> <p>Test 2006 Match not verified What is the greatest common factor of <math>48x^2</math> and <math>72x^3</math>?</p> <p>a. <math>12x^2</math></p> <p>b. <math>12x^3</math></p> <p>c. <math>24x^2</math></p> <p>d. <math>24x^3</math></p>	<p>CMP <i>Frogs, Fleas and Painted Cubes</i> 2.2 Follow-Up CMP2 <i>Frogs, Fleas and Painted Cubes</i> 2.4 Supplement</p>
8.A.11	<p>Factor a trinomial in the form <math>ax^2 + bx + c</math>; <math>a = 1</math> and <math>c</math> having no more than three sets of factors.</p> <p>Sample Test 2005 Factor <math>y^2 + 3y - 18</math> into two binomials.</p> <p><math>(y + 9)(y - 2)</math></p> <p><math>(y - 9)(y + 2)</math></p> <p><math>(y + 6)(y - 3)</math></p> <p><math>(y - 6)(y + 3)</math></p>	<p>CMP <i>Frogs, Fleas and Painted Cubes</i> 2.3 Follow-Up CMP2 2.4  Supplement</p>
8.A.12	<p>Apply algebra to determine the measure of angles formed by or contained in parallel lines cut by a transversal and by</p>	<p>Supplement teaching along with</p>

	<p>intersecting lines.</p> <p>Sample Test 2005 In the figure below, segment DC intersect Ray BA at point B. (Illustration shows angle DBA to have measure of <math>16x + 60</math> degrees and angle ABC to have measure of <math>8x</math> degrees. The two angles are supplementary.) What is the measure, in degrees, of angle ABC? <b>Show your work.</b></p> <p>Sample Test 2005 In the figure below, lines k and n are parallel. Line l is a transversal. (Illustration shows two corresponding angles A and B, with B measuring <math>7x</math> degrees and A measuring <math>2x + 35</math> degrees.) Part A What is the value of x? <b>Show your work.</b> Part B What is the measure, in degrees, of angle A? <b>Show your work.</b> Part C What is the measure, in degrees, of angle? <b>Show your work.</b></p> <p>Test 2006 Match not verified In the diagram below, lines l and k are parallel.  (Illustration of two parallel lines, l and k with point C also on line l, transversal BA with point B on line l (upper line) and point A below the lower line. Two corresponding angles have values of <math>(x + 5)</math> degrees and <math>(4x - 10)</math> degrees. Angle ABC is supplementary to the angle with a value of <math>(x + 95)</math> degrees. Part A. What is the value of x? Show your work. What is the measure, in degrees, of angle ABC?</p> <p>Test 2006 Match not verified</p>	8.G.4
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	<p>In the diagram below, line JL intersects line KM at point K.</p> <p>(Illustration as stated with two supplementary angles having values of <math>x</math> degrees (angle JKM) and <math>2x</math> degrees (angle LKM).</p> <p>What is the measure of angle JKM?</p> <ol style="list-style-type: none"> <li>30 degrees</li> <li>60 degrees</li> <li>120 degrees</li> <li>180 degrees</li> </ol>	
8.A.13	<b>Solve multi-step inequalities and graph the solution set on a number line. (Post-March)</b>	CMP2 <i>The Shapes of Algebra</i> 2.2, 2.3
8.A.14	<b>Solve linear inequalities by combining like terms, using the distributive property, or moving variables to one side of the inequality (include multiplication or division of inequalities by a negative number). (Post-March)</b>	CMP2 <i>The Shapes of Algebra</i> 2.2, 2.3

**Students will recognize, use and represent algebraically patterns, relations, and functions.**

8.A.15	Understand that a data set can be represented in multiple ways: arithmetically, algebraically, and graphically.	CMP <i>Moving Straight Ahead</i> 2.1, 2.2, 2.3, 2.5  CMP2 <i>The Shapes of Algebra</i> Inv. 1, 2, 3
8.A.16	Find a set of ordered pairs to satisfy a given linear numerical pattern (expressed algebraically; then plot the ordered pairs and draw the line.	<i>Moving Straight Ahead</i> 2.2, 2.3, 2.5  CMP2 <i>The Shapes of Algebra</i> 2.1, 3.1, 3.2
8.A.17	<b>Define and use correct terminology when referring to function (domain and range). (Post-March)</b>	CMP <i>Moving Straight Ahead</i> 2.1(function)  Supplement domain and range
8.A.18	<b>Determine if a relation is a function. (Post-March)</b>	CMP <i>Moving Straight Ahead</i>

		<i>Ahead</i> (Supplement 2.1)
8.A.19	<b>Interpret multiple representations using equations, tables of values, and graph. (Post-March)</b>	CMP <i>Moving Straight Ahead</i> 2.1, 2.2, 2.3, 2.5

***Geometry Strand***

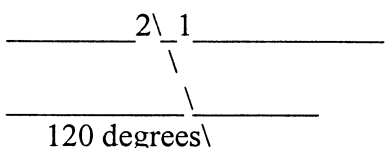
**Students will identify and justify geometric relationships, formally and informally.**

8.G.1	<p>Identify pairs of vertical angles as congruent.</p> <p>Test 2006 Match not verified. In the diagram below, which angle is congruent to angle 5? (Illustration shows 3 lines (none parallel) intersecting with 5 angles shown. Angle 5 and angle 4 are vertical, angle 5 and angle 3 are supplementary, angles 1 and 5 are within a triangle formed by the intersecting lines but lengths of sides is unknown; angles 1 and 2 are vertical angles.)</p> <ul style="list-style-type: none"> <li>a. angle 1</li> <li>b. angle 2</li> <li>c. angle 3</li> <li>d. angle 4</li> </ul> <p>Test 2006 Match not verified Line j and line k intersect as shown below. (Illustration shows two intersecting lines with angle R supplementary to angles S and T and vertical to U; angle S is supplementary to R and U and vertical to T;</p> <div style="text-align: center;"> <math display="block">\begin{array}{c} R \backslash S \\ \text{-----} \backslash \text{-----} \\ T \backslash U \end{array}</math> </div> <p>Which pairs of angles are congruent?  angle s and angle r; angle t and angle u  angle r and angle t; angle u and angle s  angle t and angle s; angle u and angle r  angle u and angle t; angle t and angle s</p>	<p>Supplement/The revision of Shapes and Designs is one source.</p>
8.G.2	Identify pairs of supplementary and complementary angles.	Supplement/The revision of Shapes

	<p>Sample Test 2005 Line s and line t intersect as shown below. (Illustration of two lines intersecting with angles 1 and 3 vertical, angles 2 and 4 vertical – angles numbered clockwise 1, 2, 3, 4.)</p> <ol style="list-style-type: none"> <li>angle 2 and angle 3</li> <li>angle 2 and angle 1</li> <li>angle 3 and angle 4</li> <li>angle 3 and angle 1</li> </ol> <p>Sample Test 2005 Line j and line k intersect, as shown below. (Illustration of two lines intersecting with angles RSUT in clockwise order, R and U are vertical as are S and T.) Which two pairs are congruent angles?</p> <ol style="list-style-type: none"> <li>Angle R and angle S; angle T and angle U</li> <li>Angle R and angle T; angle U and angle S</li> <li>Angle T and angle S; angle U and angle R</li> <li>Angle T and angle U; angle T and angle S</li> </ol> <p>Sample Test 2005 In which diagram are angle 1 and angle 2 supplementary?</p> <ol style="list-style-type: none"> <li>Illustration showing vertical angles</li> <li>Illustration showing complementary angles</li> <li>Illustration showing corresponding angles</li> <li>Illustration showing supplementary angles</li> </ol> <p>Sample Test 2005 Michael drew the diagram below. (Illustration of two parallel lines with a third line perpendicular to each and a fourth line with a positive slope passing through the intersection of one of the parallel lines and the perpendicular line.) Which angle is complementary to angle x?</p> <ol style="list-style-type: none"> <li>angle P</li> <li>angle Q</li> <li>Angle R</li> <li>Angle S</li> </ol> <p>Sample Test 2005 Bryce drew the four angles shown below.</p>	<p>and Designs is one source.</p>
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	<p>(Illustration: Angle C 59 degrees; Angle B 119 degrees; angle C 61 degrees; angle D 31 degrees)</p> <p>Part A</p> <p>Which pair of angles are complementary?</p> <p>Which pair of angles are supplementary?</p> <p>Part B</p> <p>On the lines below, explain how you determined your answers.</p> <p>Test 2006</p> <p>Match not verified</p> <p>In the diagram below, which angles are complementary?</p> <p>(Illustration shows a horizontal line, intersected by a vertical line and a non-vertical line. Angle 1 is a right angle, angles 2 and 3 are complementary angles, angles 4 and 5 are supplementary angles.)</p> <ol style="list-style-type: none"> <li>Angle 3 and angle 1</li> <li>Angle 3 and angle 2</li> <li>Angle 3 and angle 4</li> <li>Angle 3 and angle 5</li> </ol>	
8.G.3	<p>Calculate the missing angle in a supplementary or complementary pair.</p> <p>Sample Test 2005</p> <p>The angles shown below are supplementary. The measure of angle PQR is <math>2x</math>.</p> <p>(Illustration of two angles PQR and STU)</p> <p>What expression represents the measure of angle STU?</p> <ol style="list-style-type: none"> <li><math>90 - 2x</math></li> <li><math>90 + 2x</math></li> <li><math>180 + 2x</math></li> <li><math>180 - 2x</math></li> </ol> <p>Sample Test 2005</p> <p>Angle A = <math>x + 2</math> and angle B = <math>2x + 4</math>.</p> <p>(Illustration showing 2 lines intersecting and angles A and b are supplementary.)</p> <p>What is the measurement of angle A?</p> <ol style="list-style-type: none"> <li>30 degrees</li> <li>60 degrees</li> <li>90 degrees</li> <li>120 degrees</li> </ol> <p>Sample Test 2005</p> <p>What is the measure of angle x in the diagram below?</p>	<p>Supplement/The revision of Shapes and Designs is one source.</p>

	<p>(Illustration shows two supplementary angles, one measuring 125 degrees and the other x degrees.)</p> <ul style="list-style-type: none"> <li>a. 45 degrees</li> <li>b. 55 degrees</li> <li>c. 125 degrees</li> <li>d. 180 degrees</li> </ul> <p>Test 2006 Match not verified Luther makes a table in his shop class. A diagram of the top of the table is shown below. (The illustration is needed. Angle Y is supplementary to a 45 degree angle.) What is the measure of angle y?</p> <ul style="list-style-type: none"> <li>a. 45 degrees</li> <li>b. 55 degrees</li> <li>c. 135 degrees</li> <li>d. 145 degrees</li> </ul>	
8.G.4	<p>Determine angle pair relationships when given two parallel lines cut by a transversal.</p> <p>Sample Test 2005 In the diagram below, line k and line n are parallel. Line l is a transversal. (Illustration of lines k and n intersected by line l. Angle 1 is to right of transversal and above the upper line. Angle 2 is to the left of the transversal and above the lower line.)</p> <ul style="list-style-type: none"> <li>a. complementary</li> <li>b. corresponding</li> <li>c. supplementary</li> <li>d. vertical</li> </ul> <p>Test 2006 Match not verified In the diagram below, line NP and line ST are parallel, and line MQ intersects both lines. (Illustration as stated with angle x and a 40 degree angle forming corresponding angles.) What is the measure of angle x?</p> <ul style="list-style-type: none"> <li>a. 40 degrees</li> <li>b. 90 degrees</li> <li>c. 140 degrees</li> <li>d. 180 degrees</li> </ul>	Supplement/The revision of Shapes and Designs is one source.
8.G.5	<p>Calculate the missing angle measurements when given two parallel lines cut by a transversal.</p>	<u>Supplement</u> The revision of

	<p>Test 2006 Match not verified</p> <p>In the diagram below, lines <math>n</math> and <math>m</math> are parallel. (Illustration of two parallel lines cut by a transversal with angles 1 and 2 above the upper line and on either side of transversal and 120 degrees below lower line and to left of transversal forming alternate exterior angles with angle 1.)</p>  <p>What is the measure, in degrees, of angle 1? On the lines below, explain how you determined the measure of angle 1.</p> <p>What is the measure, in degrees, of angle 2? On the lines below, explain how you determined the measure of angle 2</p>	Shapes and Designs is one source.																
8.G.6	<p>Calculate the missing angle measurements when given two intersecting lines and an angle.</p> <p>Sample Test 2005 The figure below shows parallel lines cut by a transversal. (Illustration of two parallel lines cut by a transversal with angles <math>y</math>, <math>z</math>, <math>x</math>, and <math>w</math> where <math>z</math> and <math>y</math> are on opposite sides of transversal and above upper line, <math>w</math> is opposite <math>y</math> and <math>x</math> is opposite <math>z</math>. Angles <math>a</math>, <math>d</math>, 51 degrees and <math>b</math> are in similar positions where <math>z</math> and <math>a</math> correspond, <math>y</math> and <math>d</math> correspond, <math>x</math> and 51 correspond and <math>w</math> and <math>b</math> correspond.</p> <p>Part A Based on the information in the figure, complete the table below with the measures for each angle.</p> <table><tr><th>Angle</th><th>A</th><th>B</th><th>D</th><th>W</th><th>X</th><th>Y</th><th>Z</th></tr><tr><th>Degree Meas.</th><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> <p>Part B Name one pair of supplementary angles in the figure.</p>	Angle	A	B	D	W	X	Y	Z	Degree Meas.								<u>Supplement</u> (The revision of Shapes and Designs is one source.)
Angle	A	B	D	W	X	Y	Z											
Degree Meas.																		

**Students will apply transformations and symmetry to analyze problem solving situations.**



8.G.7	<p>Describe and identify transformations in the plane, using proper function notation (rotations, reflections, translations, and dilations).</p> <p>Test 2006 Match not verified Ana drew two figures on the coordinate grid shown below, (Illustration of grid with two hexagons, with corresponding vertices 6 units apart horizontally. Hexagon A is to the right of hexagon B.) Which transformation did Ana apply to Figure A to get Figure B?</p> <ol style="list-style-type: none"> <li>rotated 90 degrees</li> <li>dilated by 6</li> <li>reflected in the y-axis</li> <li>translated 6 units to the left</li> <li></li> </ol>	<p>Kaleidoscopes, Hubcaps and Mirrors, 3.1, 3.2, 3.3 Stretching and Shrinking, 2.1, 2.3</p>
8.G.8	<p>Draw the image of a figure under rotations of 90 and 180 degrees.</p> <p>Sample Test 2005 Brian drew a rectangle on the grid below. On the same grid, rotate the rectangle both 90 degrees and 180 degrees clockwise about the origin. Label point A from the rectangle Brian drew as A' on your 90 degree rotated figure and as A'' on your 180 degree rotated figure. (Illustration shows 4 quadrants of grid with each axis from -6 to 6. Vertices of Brian's rectangle are at (0,2), (0,5), (5,5) and (5,2). Vertex A is at (5, 5).)</p>	<p>Kaleidoscopes, Hubcaps and Mirrors, 2.3</p>
8.G.9	<p>Draw the image of a figure under a reflection over a given line.</p>	<p>Kaleidoscopes, Hubcaps and Mirrors,</p>

	<p>Test 1006 Match not verified Melissa drew the shape on the grid shown below. Draw the reflection of this shape in the x-axis. Label the coordinates of each point on the new figure.</p> <p>(Illustration includes all 4 quadrants on a coordinate grid with values on each axis from -9 to 9. The figure provided is in quadrant 1 with vertices at (4,8), (2,6), (4,2), and (6,6).)</p> <p>On the lines below, explain how you determined the reflection of the shape.</p> <p>Test 2006 Match not verified Gary drew a triangle on the coordinate grid shown below. (Illustration of grid with values on axes from -6 to 6; a triangle with vertices at (1, -1), (5, -1), and (4, -3).) If Gary reflects the triangle in the y-axis, what will be the new coordinates of the vertices of the triangle?</p> <ol style="list-style-type: none"> <li>(-1, -1), (4, -3), (-5, 1)</li> <li>(-1, -1), (-4, -3), (-5, -1)</li> <li>(-1, 1), (-4, 3), (5, -1)</li> <li>(1, 1), (4, 3), (5, 1)</li> </ol>	2.1
8.G.10	<p>Draw the image of a figure under a translation.</p> <p>Sample Test 2005 Shane uses a grid to decide how to arrange his living room furniture. The shape and position of Shane's sofa are shown on the grid below. He moves the sofa 4 units to the right and 2 units up. On the grid below, draw the new location of Shane's sofa. (Illustration is Quadrant I of a grid numbered 0-10 on each axis. The sofa is shaped like a backwards L with vertices at (1,1), (1,2), (3,2), (3,5), (4,5), (4,1) )</p> <p>Test 2006 Match not verified</p>	Kaleidoscopes, Hubcaps and Mirrors, 2.2

	<p>Pentagon ABCDE is drawn on the grid below.  (Grid with values on each axis from -7 to 7 and a pentagon with vertices A(-3,-2), B(-6, 1), C(-4,4), D(-1,5), E(1,3).  On the grid, draw a translation of pentagon ABCDE five units down.  Be sure to  draw the translated shape  label the translated pentagon A'B'C'D'E'  What are the coordinates for point A'?</p>	
8.G.11	<p>Draw the image of a figure under a dilation.</p> <p>Sample Test  On the grid below, draw the image of pentagon ABCDE with center at the origin after a dilation of 3. Label the image A'B'C'D'E'.  (Illustration is grid with each axis from -8 to 8. Vertices of pentagon: A (0,0), B (1,1), C (2,1), D ( 2, -1), E ( 1, -1)</p>	<p>CMP  Stretching and Shrinking 2.1 and supplement with a dilation from a projection point.</p>
8.G.12	<p>Identify the properties preserved and not preserved under a reflection, rotation, translation, and dilation.</p>	<p>Kaleidoscopes, Hubcaps and Mirrors, 4.1, 4.2, 4.3</p>

**Students will apply coordinate geometry to analyze problem solving situations.**

8.G.13	<p><b>Determine the slope of a line from a graph and explain the meaning of slope as a constant rate of change. (Post-March)</b></p>	<p><i>CMP</i>  <i>Moving Straight Ahead</i>  5.1, 5.2</p> <p><b>CMP2</b>  <i>The Shapes of Algebra</i> 3.1, 3.2</p>
8.G.14	<p><b>Determine the y-intercept of a line from a graph and be able to explain the y-intercept. (Post-March)</b></p>	<p><b>CMP</b>  <i>Moving Straight Ahead</i>  5.3</p> <p><b>CMP2</b>  <i>The Shapes of Algebra</i> 3.1, 3.2</p>
8.G.15	<p><b>Graph a line using a table of values. (Post-March)</b></p>	<p><b>CMP</b>  <i>Moving Straight Ahead</i>  5.1, 5.2, 5.3</p> <p><b>CMP2</b>  <i>The Shapes of Algebra</i> 3.1, 3.2</p>
8.G.16	<p><b>Determine the equation of a line given the slope and the y-intercept.</b></p>	<p><b>CMP</b>  <i>Moving Straight Ahead</i> 6.2, 6.3</p>

	(Post-March)	CMP2 <i>The Shapes of Algebra</i> 3.1, 3.2
8.G.17	Graph a line from an equation in slope-intercept form ( $y = mx + b$ ). (Post-March)	Moving Straight Ahead, Inv. 5 CMP2 <i>The Shapes of Algebra</i> 3.1, 3.2, 3.3
8.G.18	Solve systems of equations graphically (only linear, integral solutions, $y = mx + b$ format, no vertical/horizontal lines. (Post-March)	CMP2 <i>The Shapes of Algebra</i> 3.1, 3.2, 3.3 (Numerous problems in <i>Moving Straight Ahead</i> represent systems of equations and are solved graphically. They are not called systems, however.
8.G.19	Graph the solution set of an inequality on a number line. (Post-March)	CMP2 <i>The Shapes of Algebra</i> 2.2, 2.3
8.G.20	Distinguish between linear and nonlinear equations $ax^2 + bx + c$ ; $a = 1$ (only graphically). (Post-March)	CMP <i>Thinking with Mathematical Models</i> Inv. 1, Linear; Inv. 2, Non-linear/inverse relationships; Inv. 3, non-linear/exponential <i>Frogs, Fleas, and Painted Cubes</i> 1.2  CMP2 <i>Thinking with Mathematical Models</i> Inv. 2, Linear; Inv. 3, Non-linear/inverse relationships  <i>Frogs, Fleas, and Painted Cubes</i> 1.2
8.G.21	Recognize the characteristics of quadratics in tables, graphs, equations, and situations. (Post-March)	CMP <i>Frogs, Fleas, and Painted Cubes</i> 4.1, 4.2, 4.3  CMP2 <i>Frogs, Fleas, and Painted Cubes</i> 4.1, 4.2, 4.3
8.G.0	Construct the following using a straight edge and compass:	Supplement

	<p>Segment congruent to a segment.</p> <p>Angle congruent to an angle.</p> <p>Perpendicular bisector.</p> <p>Angle bisector. (Post-March)</p>	
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## ***Measurement Strand***

Students will determine what can be measured and how, using appropriate methods and formulas.

8.M.1	<p>Solve equations/proportions to convert to equivalent measurements within metric and customary measurement systems also allow Fahrenheit to Celsius and vice versa).</p> <p>Sample Test 2005 Tracy's dog eats 8 ounces of dog food every day. How many pounds of dog food will her dog eat in 20 days? Show your work.</p> <p>Test 2006 Match not verified Chelsea needs 16 ounces of milk for a recipe. She only has a <math>\frac{1}{4}</math>-cup measuring cup. How many times does she need to fill the <math>\frac{1}{4}</math>-cup measuring cup to measure the 16 ounces of milk?  <div style="border: 1px solid black; padding: 2px; display: inline-block;">1 cup = 8 fluid ounces</div>  Show your work.</p> <p>Test 2006 Match not verified Mark's cats eat 72 ounces of food in one week. How many pounds of food do Mark's cats eat in one week?  <div style="border: 1px solid black; padding: 2px; display: inline-block;">1 pound = 16 ounces</div>  a. <math>\frac{1}{4}</math>  b. <math>3\frac{1}{2}</math>  c. <math>4\frac{1}{2}</math>  d. <math>7\frac{1}{4}</math></p> <p>Test 2006 Match not verified</p>	<p>Supplement/ Temperature application in 6.2 of <i>Moving Straight Ahead</i></p>
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	<p>Katie converts the outside temperature from degrees Fahrenheit, F, to degrees Celsius, C. She uses the formula below to convert the temperature.</p> $(F - 32)(5/9) = C$ <p>(The ( ) around 5/9 are not on test.)</p> <p>If the outside temperature is 50 degrees Fahrenheit, what is the outside temperature in degrees Celsius?</p> <p>2</p> <p>5</p> <p>9</p> <p>10</p>	
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**Questions from Tests dealing with Performance Indicators, Post-March, Grade 7**

**7.A.1 Translate two-step verbal expressions into algebraic expressions.**

Test 2006 at Grade 8

Match not verified.

Janine's dog weighs three pounds less than twice the weight of Wanda's dog, d. Which expression represents the weight of Janine's dog?

- a.  $2 + d - 3$
- b.  $3 + d - 2$
- c.  $2d - 3$
- d.  $3 - 2d$

**7.A.2 Add and subtract monomials with exponents of one. (Post-March)**

Test 2006 at Grade 8

Match not verified

Solve for x in the equation below.

$$8(2x - 3) = -16$$

Show your work.

Test 2006 at Grade 8

Simplify the expression below.

$$3x + 9x$$

- a. 12
- b.  $12x$
- c.  $12x^2$
- d.  $12(x + x)$

7.A.4 Solve multi-step equations by combining like terms, using the distributive property, or moving variables to one side of the equation.

Test 2006 at Grade 8

Renee must solve the equation  $4x + 12 = 6x$ . If she subtracts  $4x$  from the left side of the equation, what should Renee write on the right side of the equation?

- a. 2
- b.  $2x$
- c. 10
- d.  $10x$

Test 2006 at Grade 8

Match not verified

Solve for  $y$  in the equation below.

$$-2y + 11 = -6y + 35$$

Show your work.

Test 2006 at Grade 8

Match not verified

Solve for  $x$  in the equation below.

$$2(3x - 4) - 7 = 3x + 1 + x$$

Show your work.

On the lines below, explain how to use the distributive property to help you solve this equation.

Test 2006 at Grade 8

Match not verified

Omar wants to solve the equation  $3x - 2 = 10$ . Which steps could Omar follow to find the solution?

- a. Add 2 to both sides. Then divide both sides by 3
- b. Divide both sides by 3. Then add 2 to both sides.
- c. Subtract 2 from both sides. Then divide both sides by 3
- d. Multiply both sides by 3. Then subtract 2 from both sides.

7.A.10 Write an equation to represent a function from a table of values.

Test 2006 at Grade 8

Match not verified.

Carlotta conducted an experiment on the growth rate of bacteria. The table below shows her results.

Number of hours (h)	Number of Bacteria (b)
0	20
1	56
2	92
3	128

Write a function rule for the number of bacteria,  $b$ , after  $h$  hours.

What will the number of bacteria be after 5 hours?

Test 2006 at Grade 8

Match not verified.

The table below shows a relationship between  $x$  and  $y$ .

X	2	5	6	9
Y	6	9	10	13

Which equation shows the relationship between  $x$  and  $y$ ?

- a.  $y = 3x$
- b.  $x = 3y$
- c.  $y = x + 4$
- d.  $x = y + 4$

Test 2006 at Grade 8

Match not verified

Complete the function table below with the missing values for  $y$ .

$x$	1	2	3	4	5	6
$y$	3	7	11	15		

Based on the function table, write a function rule that shows the relationship between  $x$  and  $y$ .



Test 2006 at Grade 8

Mr. Patel filled a swimming pool with water. When he started, the pool already contained 1,500 gallons. The table below shows the number of gallons of water in the pool after filling it for  $h$  hours.

Gallons of water in pool (g)	Number of hours (h)
1,500	0
2,100	1
2,700	2
3,300	3
3,900	4

Which equation can be used to determine the number of gallons,  $g$ , of water in the pool after  $h$  hours?

- a.  $g = 600h$
- b.  $g = 1,500h$
- c.  $g = 1,500 + 600h$
- d.  $g = 1,500h + 600$

### 7.M.1 Calculate distance using a map scale.

Sample Test 2005 8<sup>th</sup> grade

A path on a treasure map is shown on the grid below.

(Illustration shows straight path from A to B, another B to C, another C to X and a scale is provided showing 1 square represents 1 square mile.)

Complete the table below to calculate the total length of the path.

Path Section	Length (in miles)
Length of AB	
Length of BC	
Length of CX	
Total Path Length	

Test 2006 at Grade 8

Match not verified.

Use your ruler to help you solve this problem.

Roberta and her family drove from Tucson to the Grand Canyon. The scale map below shows the route they took and distance they drove.

**About** how many miles did Roberta and her family drive from Tucson to Phoenix.

(Map is provide with a scale of 1 inch = 100 miles)

- a. 75
- b. 100
- c. 125
- d. 150

Test 2006 at Grade 8

Match not verified.

Use your ruler to help you solve this problem.

A kangaroo named Skippy travels from Sydney to Brisbane. Based on the scale drawing below, what is the distance, in miles, Skippy travels?

Illustration of map with scale of  $\frac{1}{2}$  in. = 150 miles.

Show your work.

### 7.M.5 Calculate unit price using proportions.

Test 2006

Match not verified

Jenny's Gift Shop sells candles in a variety of packages. The cost per candle is the same in every package. A package of 8 candles costs \$12.96. Write a proportion that can be used to determine the cost of a package of 3 candles.

Proportion \_\_\_\_\_

Solve your proportion to determine the cost of a package of 3 candles.

Show your work.

### 7.M.6 Compare unit prices.

Test 2006 at Grade 8

Match not verified.

Test 2006 at Grade 8

Match not verified

The table below shows the prices of three different-sized packages containing the same type of candy.

Pkg	Wt In oz	Pkg Price	Candy Per oz
A	8	\$1.60	
B	10	\$1.80	
C	12	\$2.04	

Complete the table to determine which package has the lowest candy price, per ounce.

Show your work.

Answer: \_\_\_\_\_

## 7.G.8 Use the Pythagorean Theorem to determine the unknown length of a side of a right triangle. (Post-March)

Sample Test 2005

Item from 8<sup>th</sup> grade test

Jenna has a triangular garden, as shown in the diagram below.

(Illustration is a right triangle with a base of  $m$ , a height of 5 feet, and a hypotenuse of 13 feet.)

What is the length, in feet of side  $m$ ?

Show your work

Test 2006

Match not verified

What is the length of side  $x$  in the triangle below?

Illustration of right triangle with legs of 2 and 5 and hypotenuse  $x$ .

**Pythagorean Theorem**

$$c^2 = a^2 + b^2$$

- a. 7
- b. (sq. root) 7
- c. 29
- e. (sq. root) 29

Test 2006 at Grade 8

Match not verified.

Tyrone is building a skateboard ramp with a piece of plywood that is 8 feet long. He wants the height of the ramp to be 5 feet.

(Illustration of right triangle with height of 5 feet and hypotenuse of 8 feet.)

To make a strong ramp, the base must form a right angle with the back of the ramp.

What will be the length of the base rounded to the nearest tenth of a foot?

Show your work.

## 7.G.9 Determine whether a given triangle is a right triangle by applying the Pythagorean Theorem and using a calculator.

Test 2006 at Grade 8

Match not verified

Pat drew the triangle below.

(Illustration of triangle with sides 10 cm, 18 cm, 26 cm)

Is Pat's triangle a right triangle? Use the Pythagorean theorem to prove whether his triangle is a right triangle.

Show your work.

On the lines below, explain why your answer is correct.

## Moving Straight Ahead

(Pre-March)

Unit/Investigation	Performance Indicator/NY	Notes Estimated Time
2.1, 2.2, 2.3, 2.5	<p>8.A.15 Understand that a data set can be represented in multiple ways: arithmetically, algebraically, and graphically.</p> <p>8.A.16 Find a set of ordered pairs to satisfy a given linear numerical pattern (expressed algebraically); then plot the ordered pairs and draw the line.</p> <p><b>8.A.17 Define and use correct terminology when referring to function (domain and range).</b></p> <p><b>8.A.18 Determine if a relation is a function.</b></p> <p><b>8.A.19 Interpret multiple representations using equations, tables of values, and graph.</b></p>	<b>Supplement terms domain and range.</b>

## Supplementary Materials

(Pre-March)

Supplementary Source	Performance Indicator/NY	Notes Estimated Time
Bits and Pieces III, Inv. 4, 5 is one possible source.	<p>8.N.3 Read, write, and identify percents less than 1% and greater than 100%.</p> <p>8.N.4 Apply percents to:</p> <ul style="list-style-type: none"> <li>• Tax</li> <li>• Percent/increase/decrease</li> <li>• Simple interest</li> <li>• Sale price</li> <li>• Commission</li> <li>• Interest rates</li> <li>• Gratuities</li> </ul> <p>8.N.5 Estimate a percent of quantity, given an application.</p>	

# Kaleidoscopes, Hubcaps, and Mirrors

(Pre-March)

Unit/Investigation	Performance Indicator/NY	Notes Estimated Time
<b>Inv. 1</b>	<b>Foundations for Inv. 2, 3, 4</b>	
<b>2.1, 2.2, 2.3</b>	8.G.8 Draw the image of a figure under rotations of 90 and 180 degrees. 8.G.9 Draw the image of a figure under a reflection over a given line. 8.G.10 Draw the image of a figure under a translation.	
<b>3.1,, 3.2, 3.2</b>	8.G.7 Describe and identify transformations in the plane, using proper function notation (rotations, reflections, translations, and dilations. (all but dilation – see Stretching and Shrinking)	
<b>4.1, 4.2, 4.3</b>	8.G.12 Identify the properties preserved and not preserved under a reflection, rotation, translation, and dilation.	

## Stretching and Shrinking or other Supplementary Material

Unit/Investigation	Performance Indicator/NY	Notes Estimated Time
<b>2.1, 2.3</b>	8.G.7 Describe and identify transformations in the plane, using proper function notation (rotations, reflections, translations, and dilations. (dilation) 8.G.11 Draw the image of a figure under a dilation.	

## Supplementary Materials

(Pre-March)

Supplementary Source	Performance Indicator/NY	Notes/ Estimated Time
CMP2 <i>Shapes and Designs</i> is one source.	8.A.12 Apply algebra to determine the measure of angles formed by or contained in parallel lines cut by a transversal and by intersecting lines. 8.G.1 Identify pairs of vertical angles as congruent. 8.G.2 Identify pairs of supplementary and complementary angles. 8.G.3 Calculate the missing angle in a supplementary or complementary pair. 8.G.4 Determine the angle pair relationships when given two parallel lines cut by a transversal. 8.G.5 Calculate the missing angle measurements when give two parallel lines cut by a transversal. 8.G.6 Calculate the missing angle measurements when given two intersecting lines and an angle.	

## Frogs, Fleas and Painted Cubes

(Pre-March)

Unit/Investigation	Performance Indicator/NY	Notes Estimated Time
1.2	8.A.8 Multiply a binomial by a monomial or a binomial (integer coefficients). <b>8.G.20 Distinguish between linear and nonlinear equations.</b>	
2.2, 2.3, 2.4	8.A.6 Multiply and divide monomials 8.A.7 Add and subtract polynomials (integer coefficients). 8.A.8 Multiply a binomial by a monomial or a binomial (integer coefficients). 8.A.10 Factor algebraic expressions using the GCF. 8.A.11 Factor a trinomial in the form $ax^2 + bx + c$ ; $a = 1$ and $c$ having no more than three sets of factors.	Will likely need additional practice
4.1, 4.2, 4.3	<b>8.G.21 Recognize the characteristics of quadratics in tables, graphs, equations, and situations.</b>	

## Supplementary Materials

(Pre-March)

Supplementary Source	Performance Indicator/NY	Notes Estimated Time
	8.M.1 Solve equations/proportions to convert to equivalent measurements within metric and customary measurement systems (also allow Fahrenheit to Celsius and vice versa)	

## Moving Straight Ahead

(Post-March)

Unit/Investigation	Performance Indicator/NY	Notes Estimated Time
5.1, 5.2, 5.3	8.G.13 Determine the slope of a line from a graph and explain the meaning of slope as a constant rate of change. 8.G.14 Determine the y-intercept of a line from a graph and be able to explain the y-intercept. 8.G.15 Graph a line using a table of values. 8.G.17 Graph a line from an equation in slope-intercept form ( $y = mx + b$ )	
6.2, 6.3	8.G.16 Determine the equation of a line given the slope and the y-intercept. 8.M.1 Solve equations/proportions to convert to equivalent measurements within metric and customary measurement systems (also allow Fahrenheit to Celsius and vice versa)	6.2 includes the Fahrenheit/Celsius part of 8.M.1

## Thinking with Mathematical Models

(Post-March)

Unit/Investigation	Performance Indicator/NY	Notes Estimated Time
Inv. 1, 2, 3	8.G.20 Distinguish between linear and nonlinear equations.	

# The Shapes of Algebra

(Post-March)

Unit/Investigation	Performance Indicator/NY	Notes Estimated Time
2.1, 2.2, 2.3	<p><b>8.A.13 Solve multi-step inequalities and graph the solution set on a number line.</b></p> <p><b>8.A.14 Solve linear inequalities by combining like terms, using the distributive property, or moving variables to one side of the inequality (include multiplication or division of inequalities by a negative number).</b></p> <p><b>8.A.15 Understand that a data set can be represented in multiple ways: arithmetically, algebraically, and graphically.</b></p> <p><b>8.A.16 Find a set of ordered pairs to satisfy a given linear numerical pattern (expressed algebraically); then plot the ordered pairs and draw the line.</b></p> <p><b>8.G.14 Determine the slope of a line from a graph and explain the meaning of slope as a constant rate of change.</b></p> <p><b>8.G.19 Graph the solution set of an inequality on a number line.</b></p>	
3.1, 3.2, 3.3	<p><b>8.A.15 Understand that a data set can be represented in multiple ways: arithmetically, algebraically, and graphically.</b></p> <p><b>8.A.16 Find a set of ordered pairs to satisfy a given linear numerical pattern (expressed algebraically); then plot the ordered pairs and draw the line.</b></p> <p><b>8.G.14 Determine the y-intercept of a line from a graph and be able to explain the y-intercept.</b></p> <p><b>8.G.15 Graph a line using a table of values.</b></p> <p><b>8.G.16 Determine the equation of a line given the slope and the y-intercept.</b></p> <p><b>8.G.17 Graph a line from an equation in slope-intercept form (<math>y = mx + b</math>).</b></p> <p><b>8.G.18 Solve systems of equations graphically (only linear, integral solutions, <math>y = mx + b</math> format, no vertical/horizontal lines).</b></p>	