Mathematics – Grade 6

Adams County/Ohio Valley
Course of Study

Content Standard: Students demonstrate number sense, including an understanding of number systems and operations and how they relate to one another. Students compute fluently and make reasonable estimates using paper and pencil, technology-supported and mental methods.
Benchmark: G. Apply and explain the use of prime factorizations, common factors, and common multiples in problem situations.
Content Organizer: *Number and Number Systems*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
1. Decompose and recompose whole numbers using factors and exponents (e.g., 32=2x2x2x2x2=25), and explain why "squared" means "second power" and "cubed" means "third power." *Mini lesson due to daily math papers and minute math.	Relate and explain the terms "exponent" and "base" Explain 2^3 is read as two to the third power" Explain 3^2 is read as "three squared" <u>Method for :</u> 2x2x2x3x3 1. Count the number of times each number (base) is used as a factor (2x2x2) (3x3) 2. Write the exponent for each base $2x2x2x3x3=2^3x3^2$ <u>*3. Reinforce:</u> A. Did you write the factors with no exponents only once? B. Did you count the number of times a factor was used? (Ask students these questions)	Houghton Mifflin Chart 10 -p. 2-3, 10-11, 102, 106-107, 142 -Overhead Teaching Activities p. 27-28 -Accelerated math obj. 26 & 27 -Connected Math Prime Time Worksheet	Houghton Mifflin -p. 107 Independent Practice -p. 142 Set B -Practice 3-2 -Reteach 3-2 -Challenge 3-2 -Chapter Review p. 146 #25-27 -Chapter Test p. 148 # 13-16 <u>Saxon Math 76</u> Lesson 72 – p. 351 Practice A-D

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Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
2. Find and use the prime factorization of composite numbers. For example: (a) Use the prime factorization to recognize the greatest common factor (GCF). (b) Use the prime factorization to recognize the least common multiple (LCM). (c) Apply the prime factorization to solve problems and explain solutions.	- Explain that factors are written in order from least to greatest i.e. (2x2x3x5) - Use overhead teaching activities p. 29 to demonstrate prime factorization (need blank overhead transparency) - Have students make a list of all prime numbers less than 20 and compare the list at the bottom of their factor trees. - Review basic multiplication facts. <u>For</u> - Greatest Common Factor refer to p. 112-114 - Least Common multiple refer to p. 116-117	Houghton Mifflin - Overhead Teaching Activities p. 26, 27, 29 - p. 108-109 - Set C. p. 142 - (a, b, & c) Accelerated math obj. 26 & 27 - (a-Connected math Prime Time, b-Connected math Bits & Pieces I-II, c-Connected Math Prime Time)	Houghton Mifflin -Practice 3-3 -Reteach 3-3 -Challenge 3-3 -Chapter Review p. 146 #9-24 -Chapter Test p. 148 # 1-12 <u>Saxon Math 76</u> Lesson 61 p. 294-298 "Prime Number" activity p. 295 A-E Practice A-H p. 296 Lesson 64 p. 308-313 "Prime Factorization" Division by Primes Factor Trees" Practice A-F question # 26

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Benchmark: D. Use models and pictures to relate concepts of ratio, proportion and percent.
Content Organizer: *Number and Number Systems*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
3. Explain why a number is referred to as being "rational," and recognize that the expression $\frac{a}{b}$ can mean *a* parts of size $\frac{1}{b}$ each, *a* divided by *b*, or the ratio of *a* to *b*. *Incorporates Proficiency Outcomes 8 & 9	Explain that a rational number can be expressed in the form $\frac{a}{b}$ where a and b are not integers and b is not 0. Rational numbers include whole numbers, integers and fractions 1, 2, 3, 9, -1, -2 $\frac{1}{3}$ and - $\frac{7}{8}$ Use examples $3 = \frac{3}{1}$ $0.75 = \frac{3}{4}$ $5\ ½ = \frac{11}{2}$ Use number lines and practice with calculators changing decimals to fractions/mixed numbers and ordering least to greatest, greatest to least, etc.	Houghton Mifflin - Textbook p. 230-235 Set G p. 240 - Overhead activities p. 62-64 *LO 8 and LO 9 TGT Math Questions (See appendix) *Daily Math Proficiency incorporated in most pages. *Connected Math Bits Pieces I & II	Houghton Mifflin - Practice 5-9, 5-10 - Reteach 5-9, 5-10 - Challenge 5-9, 5-10 - Chapter Review p. 243, # 37-51 - Chapter Test p. 244 # 27-40 *LO 8 and LO 9 Math Test Assessment (see appendix)

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Benchmark:
Content Organizer: ***Number and Number Systems***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
4. Describe what it means to find a specific percent of a number, using real-life examples. *Incorporates Proficiency Outcome 8	<u>Write and Solve a proportion</u> 1) $\frac{117}{n} = \frac{18}{100}$ 2) Use cross multiplication solve for n 117 x 100 = n x 18 11,700= 18n 650=n <u>Write and Solve an equation</u> 1. 0.18 x n = 117 2. Solve equation for n $\frac{117}{0.18} = n$ n = 650 Use additional strategies to show how fractions decimals and percent are interrelated to each other and how they each represent the same thing in a different way. (i.e., $\frac{1}{3} = .33 = 33\%$)	Percent applications to real life: <u>Houghton Mifflin:</u> p. 167, 173, 329, 355, 372, 381 (Circle Graphs) p. 370-371, 378 (discounts) p. 368-373 (gain/loss) p. 366-367, 378 (interest) p. 370-371, 378 (sales tax) p. 498-499, 504-505, 534 (surveys) p. 350-379 various activities Overhead activities p. 90-99 *LO 8 TGT math Questions (See appendix) *Daily Math Proficiency on all sheets Accelerated Math Obj. 186-205 Connected Math Bits & Pieces II	<u>Houghton Mifflin</u> - practice 8-1 through 8-10 - reteach 8-1 through 8-10 - challenge 8-1 through 8-10 - chapter review p. 380-381 - chapter test p. 382-383 *LO 8 Math Assessment Test (see appendix)

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Benchmark: D. Use models and pictures to relate concepts of ratio, proportion and percent.
Content Organizer: *Number and Number Systems*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
5. Use models and pictures to relate concepts of ratio, proportion and percent, including percents less than 1 and greater than 100.	Teach students how to set up problems to solve in ration/proportion, compare i.e., "There are 6 golf balls in a pack. "How many golf balls are in 9 packs?" $\frac{p}{b}=\frac{p}{b} \longrightarrow \frac{1}{6}=\frac{9}{p}$ P = Use cross concept to solve. 1P = 9 x 6 1P = 54 P = 54 Additionally use Houghton Mifflin Overhead Activities p. 79-89 to teach additional strategies (steps laid out)	LO 10 TGT Math (see appendix) <u>Houghton Mifflin</u> - Overhead Activities p. 79-89 - Teacher Resource Book p. 113-114 - Textbook p. 304-339 various activities - Daily Math Proficiency practice on all sheets. - Accelerated Math Obj. 186-205 - Connected Math Bits & Pieces II	LO 10 Math Test (see appendix) <u>Houghton Mifflin</u> Practice 7-1 through 7-12 Reteach 7-1 through 7-12 Challenge 7-1 through 7-12 Chapter Review p. 340-341 Chapter Test p. 342-343

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Benchmark: E. Use order of operations, including use of parenthesis and exponents to solve multi-step problems, and verify and interpret the results.
Content Organizer: *Meaning of Operations*

Grade Level Indicator	***Instructional Activities/Strategies***	***Resources***	***Assessment***
6. Use the order of operations, including the use of exponents, decimals and rational numbers, to simplify numerical expressions. Incorporate Proficiency Outcome 13 and 14.	Teach students the order of operations by relating to distributive property and with PEMDAS concept. P – Please (parenthesis) E – Excuse (exponents) M – My (multiplication) D – Dear (division) A – Aunt (addition) S – Sally (subtraction) The PEMDAS concept tells that the order of a problem should be solved in (parenthesis first, exponents 2nd etc.) Strategies students should know include: Solving a problem, i.e., 8 x (10 + 5) – (9 + 5) = A 811 B 8 C 1154 D 106 Also relate to proficiency outcome 14 – Algebraic and Arithmetic Logic – Algebraic – Pedmas Arithmetic left to right	*TGT Math Study Guide * TGT LO 13 & 14 (See appendix for above) <u>Houghton Mifflin</u> Overhead activities p. 67-69 Textbook p. 258-261 *Daily Math Proficiency incorporated in most sheets. *Accelerated Math obj. 33-34 * Connected Math Bits & Pieces I	*Math Tests LO 13 and 14 (see appendix) <u>Houghton Mifflin</u> Practice 6-3, 6-4 Reteach 6-3, 6-4 Challenge 6-3, 6-4 Chapter Review p. 294 (#21-27) Chapter Test p. 296 (#1-22)

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Content Standard: Students demonstrate number sense, including an understanding of number systems and operations and how they relate to one another. Students compute fluently and make reasonable estimates using paper and pencil, technology-supported and mental methods.
Benchmark: I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.
Content Organizer: *Meaning of Operations*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
7. Use simple expressions involving integers to represent and solve problems; e.g., if a running back loses 15 yards on the first carry but gains 8 yards on the second carry, what is the net gain/loss?	Use number line on overhead to demonstrate the difference between positive integers, negative integers, negative integers and 0, which is neither negative or position. - compare and order integers - add integers - subtract integers - multiply integers - divide integers - use calculator to perform operations - use problem solving activities at the end of each lesson for desired outcome *Emphasize that fractions and decimals are not integers, unless the fraction would be $\frac{2}{2}$ $\frac{5}{5}$ etc…..which equals a whole.	Houghton Mifflin Overhead activities 5-1 and 5-7 Textbook p. 206-209 Teacher Resource Book p. 25 *Accelerated Math obj. 206-214 *Connected Math Bits & Pieces II	Houghton Mifflin Practice 5-1, 5-2 Reteach 5-1, 5-2 Challenge 5-1, 5-2 Textbook p. 207 (20-23) p. 209 (28-31) p. 241 Chapter Review p. 242-243 Chapter Test p. 244-245

Content Standard: Students demonstrate number sense, including an understanding of number systems and operations and how they relate to one another. Students compute fluently and make reasonable estimates using paper and pencil, technology-supported and mental methods.
Benchmark: H. Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers.
Content Organizer: *Meaning of Operations*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
8. Represent multiplication and division situations involving fractions and decimals with models and visual representations; e.g., show with pattern blocks what it mean to take: $2\frac{2}{3} - \frac{1}{6}$	Use overhead transparencies to: -multiply decimals x decimals centimeter grid and calculator -divide decimals by whole numbers with centimeters, grid -multiply fractions with grid transparency -multiply mixed numbers with fraction circles -divide by fraction with fraction circles -use calculator to divide by a fraction -divide fractions and whole numbers with fraction circles -divide mixed numbers -use a calculator to divide mixed numbers	Houghton Mifflin -Teacher Resource Book p. 13-14, 30-31 -Overhead Activities p. 8-9, 12-14, 44-51 (decimal and fractions) -Textbook p. 21, 23, 33, 35, 169, 171, 175, 179, 195 *Accelerated Math obj. 112-124 *Connected Math Bits & Pieces II	Houghton Mifflin Practice 1-8, 1-9, 1-13, 1-14, 4-5, 4-6, 4-8, 4-10 Reteach 1-8, 1-9, 1-13, 1-14, 4-5, 4-6, 4-8, 4-10 Challenge 1-8, 1-9, 1-13, 1-14, 4-5, 4-6, 4-8, 4-10 Chapter Review p. 51 and 197 Chapter Test p. 53 and 199

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Course of Study

Content Standard: Students demonstrate number sense, including an understanding of number systems and operations and how they relate to one another. Students compute fluently and make reasonable estimates using paper and pencil, technology-supported and mental methods.
Benchmark: D. Use models and pictures to relate concepts of ratio, proportion and percent.
Content Organizer: *Meaning of Operations*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
9. Give examples of how ratios are used to represent comparisons; e.g., part-to-part, part-to-whole, whole-to-part.	Teach students how to set up problems to solve in ration/proportion, compare i.e., "There are 6 golf balls in a pack. "How many golf balls are in 9 packs?" $\frac{p}{b} = \frac{p}{b} \longrightarrow \frac{1}{6} = \frac{9}{p}$ P = Use cross concept to solve. 1P = 9 x 6 1P = 54 P = 54 Additionally use Houghton Mifflin Overhead Activities p. 79-89 to teach additional strategies (steps laid out)	LO 10 TGT Math (see appendix) <u>Houghton Mifflin</u> - Overhead Activities p. 79-89 - Teacher Resource Book p. 113-114 - Textbook p. 304-339 various activities - Daily Math Proficiency practice on all sheets. - Accelerated Math Obj. 186-205 - Connected Math Bits & Pieces II	LO 10 Math Test (see appendix) <u>Houghton Mifflin</u> Practice 7-1 through 7-12 Reteach 7-1 through 7-12 Challenge 7-1 through 7-12 Chapter Review p. 340-341 Chapter Test p. 342-343

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Benchmark:
Content Organizer: ***Meaning of Operations***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
10. Recognize that a quotient may be larger than the dividend when the divisor is a fraction; e.g., $6 - \frac{1}{2} = 12$	Use overhead activity 4-9 in Houghton Mifflin and fraction circles for students to have students experience hands-on why this concept is. It is important to teach reciprocals in dividing fractions, mixed numbers, etc. as well so the students see the process. The process of inversion leads the students to discovering why the quotient may be larger.	Houghton Mifflin Overhead activities p. 46, 49 Textbook – p. 172, 176-177 Accelerated Math obj. 112-124 Connected Math Bits & Pieces II	Houghton Mifflin Practice 4-7, 4-9 Reteach 4-7, 4-9 Challenge 4-7, 4-9 Chapter Review p. 196 Chapter Test p. 198

Content Standard*:* Students demonstrate number sense, including an understanding of number systems and operations and how they relate to one another. Students compute fluently and make reasonable estimates using paper and pencil, technology-supported and mental methods.
Benchmark: I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.
Content Organizer: *Computation and Estimation*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
11. Perform fraction and decimal computation and justify their solutions; e.g. using manipulatives, diagrams, mathematical reasoning.	Teach students to: A) Multiply decimals by whole numbers B) Multiply decimals by decimals C) Divide decimals by whole numbers D) Divide decimals by decimals E) Add and subtract fractions F) Add fractions and mixed numbers G) Subtract fractions and mixed numbers H) Multiply fractions I) Multiply mixed numbers J) Reciprocals K) Divide by a fraction L) Divide fractions and whole numbers M) Divide mixed numbers	Houghton Mifflin p. 20-21, 22-23, 32-33, 34-35, 156-157, 158-160, 162-163, 168-179 Accelerated Math obj. 11-124 Connected Math Bits & Pieces I Practice & Learn: p. 205 Fractions p. 206 Fractions & Decimals p. 207 Comparing & Ordering Fractions p. 208 Adding & Subtracting Fractions p. 209 Multiplying & Dividing Fractions p. 210 Practice Multiplying & Dividing Fractions & Mixed Numbers	Houghton Mifflin Various correlations-practice, reteach, challenge Chapter Review p. 50-51 Chapter Test Practice 4-1 Reteach 4-1 Practice 4-2 Reteach 4-2 Quick Check p. 182 questions 1-14

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Benchmark: H. Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers.
Content Organizer: *Computation and Estimation*

Grade Level Indicator	***Instructional Activities/Strategies***	***Resources***	***Assessment***
12. Develop and analyze algorithms for computing with fractions and decimals and demonstrate fluency in their use. *Incorporates LO 7, 8 & 9 of the Ohio 6th grade proficiency test.	Teach students the following concepts: A) Equivalent fractions B) Problem solving by setting up an equation C) The relationship of fractions, decimals, and percent D) How to interchange and find fractions, decimals, and percent using a calculator E) Explain how they found (i.e.,) the fraction and percent if they were given a decimal F) Use a number line to place fractions, mixed numbers, decimals, etc. G) Use greater than, less than signs when comparing fractions and decimals H) Place fractions and decimals in order (largest to smallest and smallest to largest)	*TGT Math Sheets *LO 7 *LO 8 *LO 9 (see appendix) Daily Math Proficiency and incorporated in most pages Houghton Mifflin Teachers Resource Book p. 3, 22-25, 28-31 Houghton Mifflin Text p. 20-23, 32-35, 156-160, 162-163, 168-171, 174-179 Accelerated Math obj. 112-124 Connected Math Bits & Pieces II	*TGT Math Test Assessment *LO 7 *LO 8 *LO 9 (see appendix) -various practice, reteach and challenge pages in Houghton Mifflin – coordinate with page working on in text reference.

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Benchmark: I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.
Content Organizer: *Computation and Estimation*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
13. Estimate reasonable solutions to problem situations involving fractions and decimals without necessarily performing the computation; e.g., $\frac{7}{8}+\frac{12}{13}=2$ or 4.23 x 5.8 = 25 *Incorporates outcome 20 on proficiency test	Teach students to round to the nearest half or whole: -with fractions have students use a calculator to practice changing to decimals, which helps them to see difficult fractions such as $\frac{5}{12}$ -have students work in cooperative groups or peer tutoring to generate lists of fractions, decimals and mixed number. Then have them round those and perform computation tasks.	*Show What You Know Teacher Guide *TGT Math Questions LO 20 (see appendix) *Daily Math Proficiency incorporated in most sheets toward middle to end. *Accelerated Math obj. 11-120 *Connected Math Bits & Pieces II	Math Test LO 20 (see appendix)

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Benchmark: J. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.
Content Organizer: *Computation and Estimation*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
14. Use proportional reasoning, ratios, and percents to represent problem situations and determine the reasonableness of solutions. *Incorporates LO 24 on proficiency test	Set-up cooperative learning groups and have students at each group have the following manipulatives. -spinners -dice -cards -coins Teach students to relate probability to ratio/percent Have students work cooperatively to complete problems 1-9 on TGT Math Sheet and discuss. Have students create their own problems and have cooperative team members or a partner solve.	*Test math questions LO 24 (see appendix) *Daily math proficiency incorporated in most sheets. *Accelerated Math obj. 204-205 *Connected Math Bits & Pieces II	*Math Test LO 24 (see appendix)

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Benchmark: J. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.
Content Organizer: *Computation and Estimation*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
15. Determine the percent of a number and sol e related problems; e.g., find the percent markdown if the original price was $140, and the sale price is $100.	<u>Write and Solve a proportion</u> 1) $\frac{117}{n} = \frac{18}{100}$ 2) Use cross multiplication solve for n 117 x 100 = n x 18 11,700= 18n 650=n <u>Write and Solve an equation</u> 1. 0.18 x n = 117 2. Solve equation for n $\frac{117}{0.18} = n$ n = 650 Use additional strategies to show how fractions decimals and percent are interrelated to each other and how they each represent the same thing in a different way. (i.e., $\frac{1}{3} = .33 = 33\%$)	Percent applications to real life: <u>Houghton Mifflin:</u> p. 167, 173, 329, 355, 372, 381 (Circle Graphs) p. 370-371, 378 (discounts) p. 368-373 (gain/loss) p. 366-367, 378 (interest) p. 370-371, 378 (sales tax) p. 498-499, 504-505, 534 (surveys) p. 350-379 various activities Overhead activities p. 90-99 *LO 8 TGT math Questions (See appendix) *Daily Math Proficiency on all sheets Accelerated Math Obj. 202 Connected Math Bits & Pieces II	<u>Houghton Mifflin</u> - practice 8-1 through 8-10 - reteach 8-1 through 8-10 - challenge 8-1 through 8-10 - chapter review p. 380-381 - chapter test p. 382-383 *LO 8 Math Assessment Test (see appendix)

Content Standard: Students estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools and technologies.
Benchmark: F. Analyze and explain what happens to area and perimeter or surface area and volume when the dimensions of an object are changed. G. Understand and demonstrate the independence of perimeter and area for two-dimensional shapes and of surface area and volume for three-dimensional shapes.
Content Organizer: *Measurement Units*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
1. Understand and describe the difference between surface area and volume. *Incorporates Proficiency outcome 12 and 16.	*Students need multiple practice that is going on throughout year to understand this concept. *Surface Area – the sum of the areas of all the surfaces of a solid figure. *Volume-of a solid figure is a measure of the space enclosed by the figure. - For surface area, students need much practice in finding area of rectangle, squares, triangles, and circles. - For volume, students need much practice in finding the volume of a cube (1xwxh) as well as volumes of triangles, prism, cylinder, square pyramid, rectangular pyramid, and cone -Student also need practice identifying and naming solid figures.	Houghton Mifflin Textbook p. 470-480, 482-485 Overhead Activities 10-8, 10-9, 10-10, 10-11, 10-12 *Daily math Proficiency incorporated in most sheets. *TGT Math Sheets LO 12 and LO 16 (see appendix) *Accelerated Math obj. 167-169	Houghton Mifflin - Practice: 10-8, 10-9, 10-10, 10-11, 10-12 - Reteach: 10-8, 10-9, 10-10, 10-11, 10-12 -Challenge: 10-8, 10-9, 10-10, 10-11, 10-12 -Chapter Review -Chapter Test *Math Test LO 12 and LO 16 (Appendix)

Content Standard: Students estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools and technologies.
Benchmark: C. Identify appropriate tools and apply appropriate techniques for measuring angles, perimeter or circumference and area of triangles, quadrilaterals, circles, and composite shapes, and surface area and volume of prisms and cylinders.
Content Organizer: ***Measurement Units***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
2. Use strategies to develop formulas for finding circumference and area of circles and to determine the area of sectors; e.g., ½ circle , 2/3 circle, 1/3 circle and ¼ circle. *Incorporates Proficiency Learning Outcome 16	Teach students working knowledge of the terms: circumference, diameter, pi (Π), radius - Given radius – students know formula C=2 Π r to find the circumferences - Given the diameter, students use the formula C = Π d to find the circumferences. - To find the area of a circle use the formula A = Π r^2	Houghton Mifflin Textbook 460-462, 463, 464-465 Overhead Activities 10-5, 10-6 *TGT math Review LO 16 (See appendix) *Daily Math Proficiency incorporated in some sheets. *Accelerated math obj. 158 & 166 * Connected Math Covering & Surroundings	Houghton Mifflin - Practice 10-5, 10-6 - Reteach 10-5, 10-6 - Challenge 10-5, 10-6 - Textbook p. 468-483 - Chapter Review 486-487 - Chapter Test p. 488 *Math Test Lo 16 (See Appendix)

Content Standard: Students estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools and technologies.
Benchmark: C. Identify appropriate tools and apply appropriate techniques for measuring angles, perimeter or circumference and area of triangles, quadrilaterals, circles, and composite shapes, and surface area and volume of prisms and cylinders.
Content Organizer: *Measurement Units*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
3. Estimate perimeter or circumference and area for circles, triangles, and quadrilaterals, and surface area and volume for prisms and cylinders by: (a) estimating lengths using string or links, areas using tiles or grid, and volumes using cubes; (b) measuring attributes (diameter, side lengths, or heights) and using established formulas for circles, triangles, rectangles, parallelograms and rectangular prisms.	Teach students rounding skills in order to be able to apply formulas to situations where they can estimate. Students need to know formulas beforehand to complete these activities, which should be incorporated as much as possible in the lessons on these (See p. 16-17 of course of study)	Houghton Mifflin 3a – p. 451, 473, 475 3b – 170, 272, 408-409, 450, 452-453, 464-465, 474, 478-179, 490-491 Accelerated Math obj. 155, 158, 167, 169 Connected Math a-b, Coverings & Surroundings	NOTE: Because estimation is an on-going process, and incorporated that way in the Houghton Mifflin Series, teachers should both assess this item informally as they teach indicators 1 and 2 and should develop their own practice and assessment sheet. List Assessments below: _____

Content Standard: Students estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools and technologies.
Benchmark: E. Use problem solving techniques and technology as needed to solve problems involving length, weight, perimeter, area, volume, time and temperature.
Content Organizer: ***Use Measurement Techniques and Tools***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
4. Determine which measure (perimeter, area, surface areas, volume) matches the context for a problem situation; e.g., perimeter is the context for fencing a garden, surface area is the context for painting a room.	This strategy builds on students knowing what perimeter area, surface area, and volume are. - Students should be given examples on chart paper, i.e., painting a house (surface area), amount of fence needed to fence a field (perimeter), the amount of corn a silo can hold (volume), etc. -Students should then brainstorm other questions to use for discussion. This can be done as a small group with questions coming back to larger group.	Houghton Mifflin p. 450, 472-474 Textbook (reference only) Teacher and student generated materials. Accelerated Math obj. 157, 161-168 Connected math Bits & Pieces II, Coverings & Surroundings	Teacher and student generated questions. List Assessment ad share here: _____

Content Standard: Students estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools and technologies.
Benchmark: G. Understand and demonstrate the independence of perimeter and area for two-dimensional shapes and of surface area and volume for three-dimensional shapes.
Content Organizer: ***Use Measurement Techniques and Tools***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
5. Understand the difference between perimeter and area, and demonstrate that two shapes may have the same perimeter, but different areas or they may have the same area, but different perimeters. *Incorporates Proficiency Learning Outcome 16	An outstanding way to teach this lesson is as a discovery lesson for students. Start out by giving each student the following: "You have 300 feet of fence to fence a field rectangular, square, triangular, circular, etc." Then have students find: -which shape gives the least area? - are farms set up this way? Why or Why not? Additional activities can be teacher or student generated.	Houghton Mifflin p. 450-451 (Reference only) TGT Math LO 16 (See appendix) Accelerated math obj. 155-156, 160, 162, 165, 167 Connected Math Bits & Pieces II, Coverings & Surroundings	*Math Test LO 16 (See appendix) *Additional Assessments need developed or shared.

Content Standard: Students estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools and technologies.
Benchmark: F. Analyze and explain what happens to area and perimeter or surface area and volume when the dimensions of an object are changed.
Content Organizer: ***Use Measurement Techniques and Tools***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
6. Describe what happens to the perimeter and area of a two-dimensional shape when the measurements of the shape are changed; length of sides are doubles. *Incorporates Proficiency Outcome # 1 of Ohio 6th grade proficiency test.	Have students work sample problems that are teacher generated on board or chart paper. Problems should include squares, triangles, circles, rectangles, etc. allow students to "discover" the pattern (which all classes always do) that doubling any area is the same as finding the area by multiplying by 4. allow students to practice and question as they try this rule on circles, triangles, squares, rectangles, etc.	Houghton Mifflin p. 451 (Reference only) *TGT Math Sheet LO 1 (See Appendix) *Daily Math Proficiency incorporated in many sheets. Accelerated Math obj. 155-156, 160, 162, 165, 167 Connected Math Bits & Pieces II, Coverings & Surroundings	*Math Test LO 1 (see appendix)

Adams County/Ohio Valley
Course of Study

Content Standard: Students estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools and technologies.
Benchmark:
Content Organizer: ***Use Measurement Techniques and Tools***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
6. Use strategies to develop formulas for determining perimeter and area of triangles, rectangles and parallelograms, and volume of rectangular prisms.	E. Houghton Mifflin overhead activity 10-17 Model how to find volume of rectangular prisms. • Houghton Mifflin practice 10-17 F. Accelerated Math objective 152 G. Hardhatting in a Geo-World students find out how areas of rectangles with equal perimeter compare. H. Hardhatting in a Geo-World. Students find and measure squares, rectangles, and circles on the play ground.	E. Houghton Mifflin text p. 498-499 • Houghton Mifflin overhead activity 10-17 • Houghton Mifflin practice workbook p. 137 • Cubes (centimeter or inch) F. Accelerated Math Program G. Hardhatting in a Geo-World p. 91-94 (Appendix 4) • 32 cm length of string • 4 push pins • 1 cardboard box • transparent tape H. Hardhatting in a Geo-World p. 105-107 (Appendix 5) • Meter sticks • Trundle wheels or metric tapes • calculators	E. Houghton Mifflin Quick Check p. 502 • Houghton Mifflin Chapter test 510-511 • Have students find the area of rectangular prisms made from cubes. F. Accelerated Math test objective 152

Adams County/Ohio Valley
Course of Study

Content Standard: Students identify, classify, compare and analyze characteristics, properties and relationships of one-, two-, and three-dimensional geometric figures and objects. Students use spatial reasoning, properties of geometric objects and transformations to analyze mathematical situations and solve problems.
Benchmark: D. Identify, describe and classify types of line pairs, angles, two-dimensional figures and three-dimensional objects using their properties.
Content Organizer: *Characteristics and Properties*

Grade Level Indicator	***Instructional Activities/Strategies***	***Resources***	***Assessment***
1. Classify and describe two-dimensional and three-dimensional geometric figures and objects by using their properties; e.g., interior angle measures, perpendicular/parallel sides, congruent angles/sides. *Incorporates proficiency learning outcome 12	Have students identify and study in peer group pairs or cooperative learning teams the following concepts/shapes: - polygon - regular polygon - irregular polygon - prisms - pyramids - cone - circle - sphere - cylinder In addition, students should be able to identify the properties ie., the number of sides of each below: - pentagon - heptagon - decagon - triangle - quadrilateral - nonagon - hexagon - octagon	Houghton Mifflin p. 404-406, 408-409, 418-420 Overhead activities 9-8, 9-9, 9-12 *TGT math Sheets LO 12A & LO 12B (See appendix) *Daily Math Proficiency incorporated in later sheets. *Accelerated Math obj. 140-141 *Connected Math Shapes & Designs	Houghton Mifflin Practice 9-8, 9-9, 9-12 Reteach 9-8, 9-9, 9-12 Challenge 9-8, 9-9, 9-12 p. 428 Text p. 440 Chapter Review Chapter Test *Math Test LO 12A *Math Test LO 12B (See appendix)

Content Standard: Students identify, classify, compare and analyze characteristics, properties and relationships of one-, two-, and three-dimensional geometric figures and objects. Students use spatial reasoning, properties of geometric objects and transformations to analyze mathematical situations and solve problems.
Benchmark: D. Identify, describe and classify types of line pairs, angles, two-dimensional figures and three-dimensional objects using their properties.
Content Organizer: ***Characteristics and Properties***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
2. Use standard language to define geometric vocabulary; vertex, face, altitude, diagonal, isosceles, equilateral, acute, obtuse and other vocabulary as appropriate.	Teach language in context of Geometry and Spatial sense so that students have a hands-on experience and working knowledge of geometric vocabulary. Correlate with lessons on: - surface area - volume - drawing and measuring angles - plane figures - triangles and angle sums - congruence and constructions - similar figures - polygons - transformations	Houghton Mifflin Test p. 390, 392-395, 398-399, 404-406, 412-418, 420, 426-431 Overhead Activities 9-1 9-2 9-3 9-4 9-5 9-7 9-10 9-11 9-12 9-14 9-15 Accelerated math obj. 140-141 Connected Math Shapes & Designs	Ongoing Houghton Mifflin Practice, Reteach, Challenge 9-1 9-2 9-3 9-4 9-5 9-7 9-10 9-11 9-12 9-14 9-15

Adams County/Ohio Valley
Course of Study

Content Standard: Students identify, classify, compare and analyze characteristics, properties and relationships of one-, two-, and three-dimensional geometric figures and objects. Students use spatial reasoning, properties of geometric objects and transformations to analyze mathematical situations and solve problems.
Benchmark: G. Describe and use properties of triangles to solve problems involving angle measures and side lengths of right triangles.
Content Organizer: ***Characteristics and Properties***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
3. Use multiple classification criteria to classify triangles; e.g., right scalene triangle. *Incorporates LO 18 of Ohio 6th Grade proficiency test	Teach students to classify triangles by their: A) side measurements (equilateral, isosceles, scalene) B) Angle measures (right, acute, obtuse) In addition, teach students to measure given angles, identify the above triangles when given, draw acute, obtuse, and right angles using a protractor, and to logically reason – given a circle is 360^0, a half of a circle is 180^0, a right angle is 90^0 etc.	*TGT Math Sheet LO 18 *Daily Math proficiency (incorporated in many sheets) Houghton Mifflin p. 404-406 Overhead activities: 9-3 9-4 9-5 9-7 *Accelerated Math obj. 146 *Connected Math Shapes & Designs	*Math test Lo 18 (see appendix) Houghton Mifflin p. 437, 442 Practice 9-7 Reteach 9-7 Challenge 9-7

Adams County/Ohio Valley
Course of Study

Content Standard: Students identify, classify, compare and analyze characteristics, properties and relationships of one-, two-, and three-dimensional geometric figures and objects. Students use spatial reasoning, properties of geometric objects and transformations to analyze mathematical situations and solve problems.
Benchmark: D. Identify, describe and classify types of line pairs, angles, two-dimensional figures and three-dimensional objects using their properties. J. Apply properties of equality and proportionality to solve problems involving congruent or similar figures; e.g., create a scale drawing.
Content Organizer: *Characteristics and Properties*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
4. Identify and define relationships between planes; i.e., parallel, perpendicular and intersecting.	Teach students geometric ideas of: - space - point - plane - line - line segment - ray - vertex - angle Students need to be able to: - draw and label geometric figures including the above plus – - parallel lines - perpendicular lines - intersecting lines and be able to communicate the differences between perpendicular and intersecting	Houghton Mifflin Text p. 390-391 Teacher developed materials Compass/protractor Accelerated Math obj. 141 *Connected Math Shapes & Designs	Houghton Mifflin Practice 9-1 Reteach 9-1 Challenge 9-1 Teacher developed materials.

Mathematics – Grade 6

Adams County/Ohio Valley
Course of Study

Content Standard: Students identify, classify, compare and analyze characteristics, properties and relationships of one-, two-, and three-dimensional geometric figures and objects. Students use spatial reasoning, properties of geometric objects and transformations to analyze mathematical situations and solve problems.
Benchmark: H. Predict and describe results (size, position, orientation) of transformations of two-dimensional figures.
Content Organizer: ***Characteristics and Properties***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
5. Predict and describe sizes, positions and orientations of two-dimensional shapes after transformations such as reflections, rotations, translations and dilations. Incorporates LO 11 on Ohio 6th grade proficiency test.	Students need to understand term: transformation and be given a working knowledge of how to do a translation, rotation, reflection (and not confuse reflections with refraction) Students also need practice in - comparing images to see which transformation has happened - given a drawing, make the following transformations: - rotation - translate - reflection	*TGT Math Sheet LO 11 (See appendix) *Daily Math Proficiency (incorporated in many sheets) Houghton Mifflin Test p. 426-429 Overhead activities 9-14 *Accelerated Math Obj. 151 *Connected math Shapes & Designs	Math Test LO 12 (See appendix) Houghton Mifflin Practice 9-14 Reteach 9-14

Content Standard: Students identify, classify, compare and analyze characteristics, properties and relationships of one-, two-, and three-dimensional geometric figures and objects. Students use spatial reasoning, properties of geometric objects and transformations to analyze mathematical situations and solve problems.
Benchmark: F. Describe and use the concepts of congruence, similarity and symmetry to solve problems.
Content Organizer: *Spatial Relationships*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
6. Draw similar figures that model proportional relationships; e.g., model similar figures with a 1 to 2 relationship by sketching two of the same figure, one with corresponding sides twice the length of the other. Incorporates LO 10 on Ohio 6th Grade Proficiency test ratio/proportion	Students need to understand concept of similar figures, ratio, same ratio, and scale Students need practice in *labeling, corresponding sides of similar figures *writing a proportion that represents the relationship between the pairs of corresponding sides, ie.,	*TGT Math Sheet LO 10 Question #9 (See appendix) *Daily Math proficiency (incorporated in many sheets) Houghton Mifflin Text p. 416-417 Overhead Activities 9-11 Accelerated Math Obj. 147 *Connected Math Shapes & Designs	Math Test LO 10 Question 9 (See Appendix) Houghton Mifflin Practice 9-11 Reteach 9-11

Content Standard: Students identify, classify, compare and analyze characteristics, properties and relationships of one-, two-, and three-dimensional geometric figures and objects. Students use spatial reasoning, properties of geometric objects and transformations to analyze mathematical situations and solve problems.
Benchmark: I. Identify and draw three-dimensional objects from different views (top, side, front and perspective).
Content Organizer: ***Visualization and Geometric Models***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
7. Build three-dimensional objects build with cubes and sketch the two-dimensional representations of each side, i.e., projection sets.	Students need to be taught an understanding and working knowledge of - face - base - edge - vertex In addition the student needs to know that there are solid figures such as: - polyhedron - prisms - pyramids - cylinders - cones Students then need to be shown and practice Nets Nets are plane patters that can be folded to make a solid figure. Multiple practices in using nets to build solid figures will give students understanding.	Houghton Mifflin Teacher Resource Book p. 37-45 Text p. 470-473 Overhead Activity 10-8 Accelerated Math Obj. 147 *Connected Math Shapes & Designs	Houghton Mifflin Practice 10-8 Reteach 10-8 Challenge 10-8

3Content Standard: Students use patterns, relations and functions to model, represent and analyze problem situations that involve variable quantities. Students analyze, model and solve problems sing various representations such as tables, graphs and equations.
Benchmark: A. Describe, extend and determine the rule for patterns and relationships occurring in numeric patterns, computation, geometry, graphs and other applications.
Content Organizer: ***Use Patterns, Relations, and Functions***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
1. Represent and analyze patterns, rules and functions, using physical materials, tables and graphs. *Incorporates LO 2 on Ohio 6th Grade Proficiency test	Students need a working and understanding knowledge of the following patterns: - patterns of multiples (5, 10, 15…) - patterns of squares (1, 4, 9, 16…) - ABB patterns (5, 10, 10, 15, 20, 20…) - Patterns of + and - +3-2, ie. (16, 19, 17, 20, 18) In addition students need to be able to apply patterns to tables and set up their own tables and problem solve.	*TGT Math Sheet LO 2 (See appendix) *Daily Math Proficiency (problems incorporated in many sheets) Houghton Mifflin Text p. 368-369, 466-467, 478-479, 556-557, 560-562, 563-564 Accelerated Math Obj. 215-216 Connected Math Prime Time	*Math Test LO 2 (See appendix) Houghton Mifflin Practice 8-8 Reteach 8-8

Mathematics – Grade 6

Adams County/Ohio Valley
Course of Study

Content Standard: Students use patterns, relations and functions to model, represent and analyze problem situations that involve variable quantities. Students analyze, model and solve problems sing various representations such as tables, graphs and equations.
Benchmark: A. Describe, extend and determine the rule for patterns and relationships occurring in numeric patterns, computation, geometry, graphs and other applications. E. Use rules and variables to describe patterns, functions and other relationships.
Content Organizer: *Use Patterns, Relations, and Functions*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
2. Use words and symbols to describe numerical and geometric patterns, rules and functions. *Incorporates LO 2 on Ohio 6th grade proficiency test.	Students need a working and understanding knowledge of the following patterns: - patterns of multiples (5, 10, 15…) - patterns of squares (1, 4, 9, 16…) - ABB patterns (5, 10, 10, 15, 20, 20…) - Patterns of + and - +3-2, ie. (16, 19, 17, 20, 18) In addition students need to be able to apply patterns to tables and set up their own tables and problem solve. Along with being able to apply patterns to tables, set up there own tables and solve problems, students need to be able to give written response to describe what pattern they see and how they know the next numbers are correct.	Additional Resources for practice Houghton Mifflin Text p. 10, 36, 81, 87, 109, 117, 128, 139, 327, 358, 368-369, 445, 471, 556-557, 565 Accelerated Math Obj. 215-216	*Math Test LO 2 (See appendix) Houghton Mifflin Practice 8-8 Reteach 8-8 *Daily Math Proficiency (incorporated in most pages)

Content Standard: Students use patterns, relations and functions to model, represent and analyze problem situations that involve variable quantities. Students analyze, model and solve problems sing various representations such as tables, graphs and equations.
Benchmark: D. Use symbolic algebra to represent and explain mathematical relationships.
Content Organizer: ***Use Algebraic Representation***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
3. Recognize and generate equivalent forms of algebraic expressions, and explain how the commutative, associative and distributive properties can be used to generate equivalent forms; e.g., perimeter as *2(l + w)* or *2l + w*. *Also incorporates further practice for LO # 13 on Ohio 6th grade proficiency (distributive property)	Students need to be taught the following properties, and have multiple experiences practicing them. -Associative property of addition $(\frac{1}{2}+\frac{3}{5})+\frac{3}{4}=\frac{1}{2}(\frac{3}{5}+\frac{3}{4})$ -Associative property of multiplication $(\frac{2}{3}x\frac{4}{7})x\frac{1}{6}=\frac{2}{3}x(\frac{4}{7}x\frac{1}{6})$ -Commutative property of addition $\frac{3}{4}+\frac{5}{6}=\frac{5}{6}+$ -Commutative property of multiplication $\frac{2}{5}x\frac{1}{3}=\frac{1}{3}x\frac{2}{5}$ -Distributive property $4(\frac{1}{4}+\frac{2}{3})=(4x\frac{1}{4})+(4x\frac{2}{3})$ -Additive Inverse property the additive inverse of any number is the opposite of that number . The sum of a number and its additive is zero. +8+(-8)=0 Example: $n+\frac{1}{2}=7$ $n+(\frac{1}{2}+\frac{1}{2})=7+\frac{1}{2}$ $n=6\frac{1}{2}$ -Identity Property The sum of any number and 0 is that number 5+0=5 -Zero Property –The product of a number + 0 is 0.	Houghton Mifflin Text p. 18-19, 232-233, 252-254, 256-257 Overhead Activities 5-10 6-1 6-2 *Daily Math Proficiency has incorporated practice and much discussion distributive property. Accelerated Math obj. 218	Houghton Mifflin Practice 5-10, 6-1, 6-2 Reteach 5-10, 6-1, 6-2 Chapter Review p. 294-295 Chapter Test p. 296-297

Content Standard: Students use patterns, relations and functions to model, represent and analyze problem situations that involve variable quantities. Students analyze, model and solve problems sing various representations such as tables, graphs and equations.
Benchmark: H. Solve linear equations and inequalities symbolically, graphically and numerically. K. Graph linear equations and inequalities.
Content Organizer: *Use Algebraic Representations*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
4. Solve simple linear equations and inequalities using physical models, paper and pencil, tables and graphs. *Incorporates LO # 15 on Ohio 6th grade proficiency test.	Students need to take problems and use variables/properties learned on p. 31 of this guide to write equations and solve problems this outcome builds on the properties learned on objective 3 (p. 31 of this guide) NOTE: A thorough understanding of all properties is necessary to complete this outcome.	*TGT Math Sheet LO # 15 (See appendix) *Incorporated in many of Daily Math proficiency towards the back half of supplemental. Houghton Mifflin Test p. 280-287, 314-315, 466-467, 560-562 Overhead activities 6-11, 6-12, 6-13, 6-14, 7-5, 10-7, 12-5 Accelerated Math Obj. 217 & 219	*Math Test LO 15 (See appendix) Houghton Mifflin Practice: 6-11, 6-12, 6-13, 6-14, 7-5, 10-7, 12-5 Reteach 6-11, 6-12, 6-13, 6-14, 7-5, 10-7, 12-5

Content Standard: Students use patterns, relations and functions to model, represent and analyze problem situations that involve variable quantities. Students analyze, model and solve problems sing various representations such as tables, graphs and equations.
Benchmark: C. Use variables to create and solve equations and inequalities representing problem situations. K. Graph linear equations and inequalities.
Content Organizer: *Use Algebraic Representations*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
5. Produce and interpret graphs that represent the relationship between two variables.	Students need to understand functions and the different ways to record solutions to equations to build on this outcome. Students then need to be taught to graph linear equations. In the coordination plan the graph of linear equation is a line. The coordinates of every point on this linear equation. It is required to make a table of values for the variables, then plot the ordered pairs and drawing line through the points.	Houghton Mifflin Text p. 560-561, 564-565 Extra Practice p. 583 Overhead activities 12-5, 12-6 Lesson 2 Cornerstone math Level B computers/server working with graphs. Accelerated Math obj. 217 & 219	Houghton Mifflin Practice 12-5, 12-6 Reteach 12-5, 12-6 Chapter Review p. 586-587 Chapter Test p. 588-589

Content Standard: Students use patterns, relations and functions to model, represent and analyze problem situations that involve variable quantities. Students analyze, model and solve problems sing various representations such as tables, graphs and equations.
Benchmark: C. Use variables to create and solve equations and inequalities representing problem situations. G. Write, simplify and evaluate algebraic expressions. J. Use formulas in problem-solving situations. L. Analyze functional relationships, and explain how a change in one quantity results in a change in the other
Content Organizer: *Use Algebraic Representations*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
6. Evaluate simple expressions by replacing variables with given values, and use formulas in problem-solving situations. *Incorporates LO # 5 Ohio 6th grade proficiency test.	Students need multiple opportunities to practice problem solving by: A) Using guess and check B) Working backwards C) Computing word problems using basic operations and setting up problems with variables, then replacing them with given values. D) Logical reasoning – make a table/graph Much discussion needs to follow with strategies used on problems, why the particular students chose that strategy, etc. As with all problem solving rubrics should be used to give credit for student thinking process.	*TGT Math Sheets Lo # 5 (See appendix) *Daily Math proficiency incorporated in most pages. Houghton Mifflin Additional practice Text p. 232-233, 252-254, 256-257, 262-263, 272-273, 278-279, 572-577 Accelerated Math Obj. 217 & 219	*Math Test LO # 5 (See appendix) Houghton Mifflin Practice 12-9, 12-10, 12-11 Reteach 12-9, 12-10, 12-11

Content Standard: Students use patterns, relations and functions to model, represent and analyze problem situations that involve variable quantities. Students analyze, model and solve problems sing various representations such as tables, graphs and equations.
Benchmark:
Content Organizer: ***Analyze Change***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
7. Identify and describe situations with constant or varying rates of change, and compare them. *Incorporates LO # 4 Ohio 6th grade proficiency test.	Students need to start this objective with knowledge of what information is needed in a problem and what information, if any is irrelevant. After students have mastered this concept, students need practice in graphing data and checking to see if their answers/solutions are reasonable.	*TGT Math Sheet LO # 4 (See appendix) *Daily Math Proficiency incorporated in beginning sheets Houghton Mifflin Text p. 566-567	*Math Test LO # 4 (See appendix) Houghton Mifflin Practice 12-7 Reteach 12-7 Challenge 12-7

Content Standard: Students use patterns, relations and functions to model, represent and analyze problem situations that involve variable quantities. Students analyze, model and solve problems sing various representations such as tables, graphs and equations.
Benchmark: M. Approximate and interpret rates of change from graphical and numerical data.
Content Organizer: *Analyze Change*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
8. Use technology to analyze change; e.g., use computer applications or graphing calculators to display and interpret rate of change.	Students need to practice in working with technology/calculators in preparation for proficiency tests/OGT and as a part of everyday life. Students need a working knowledge of patterns and the following types of graphs: - line graphs - bar graphs - pictographs - circle graphs - graphing linear equation	Houghton Mifflin Text p. 562 Overhead Activities 12-5 Cornerstone Math (computers) Working with Data Lesson B	Teacher developed or Cornerstone Math Pre and post tests Lesson B Working with Data

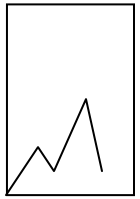
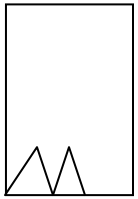
Adams County/Ohio Valley
Course of Study

Content Standard: Students pose questions and collect, organize, represent, interpret and analyze data to answer those questions. Students develop and evaluate inferences, predictions and arguments that are based on data.
Benchmark: A. Read, create and use line graphs, histograms, circle graphs, box-and-whisker plots, stem-and-leaf plots, and other representations when appropriate.
Content Organizer: *Data Collection*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
1. Read, construct and interpret line graphs, circle graph and histograms. *Incorporates LO # 22 of Ohio 6th grade proficiency test.	Students need an understanding of how to read and interpret bar graphs, circle graphs, line graphs pictographs. They also need to be taught that changing the intervals on the vertical axis can change the visual representation of what is trying to be shown (i.e., student attendance-if you use intervals of one, absences look dramatic, where as if you use intervals of 5 or 10, the absences don't show as much (see below) for 2, 4, 3, 5 and 1 absence) Student attendance May ABSENCES 6 5 4 3 2 1 0 1, 4, 5, 6, 7, 8 Student attendance May 25 20 15 10 5 0 1, 4, 5, 6, 7, 8	*TGT Math Sheets LO # 22 (See appendix) *Incorporated in many sheets of daily math Cornerstone math (Working with Data Lesson B) Houghton Mifflin Text p. 42-44, 62-64, 66-67, 68-70, 72-78, 400-401 Overhead activities 2-2 2-3 2-4 2-5 Accelerated Math Obj. 172, 175 Connected Math Data About Us	*Math Test LO # 22 (See appendix) Houghton Mifflin Practice 1-17, 2-2, 2-4, 2-5, 9-6 Reteach 1-17, 2-2, 2-4, 2-5, 9-6 Challenge 1-17, 2-2, 2-4, 2-5, 9-6 Chapter Review Pg. 147, 441 Chapter Test 149, 443

Adams County/Ohio Valley
Course of Study

Content Standard: Students pose questions and collect, organize, represent, interpret and analyze data to answer those questions. Students develop and evaluate inferences, predictions and arguments that are based on data.
Benchmark: E. Collect, organize, display, and interpret data for a specific purpose or need.
Content Organizer: *Data Collection*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
2. Select, create and use graphical representations that are appropriate for the type of data collected.	Students need an understanding of how to read and interpret bar graphs, circle graphs, line graphs pictographs. They also need to be taught that changing the intervals on the vertical axis can change the visual representation of what is trying to be shown (i.e., student attendance-if you use intervals of one, absences look dramatic, where as if you use intervals of 5 or 10, the absences don't show as much (see below) for 2, 4, 3, 5 and 1 absence) Student attendance May A B S E N C E S 6 5 4 3 2 1 1, 4, 5, 6, 7, 8  Student attendance May 25 20 15 10 5 0 1, 4, 5, 6, 7, 8 	*TGT Math Sheets LO # 22 (See appendix) *Incorporated in many sheets of daily math Cornerstone math (Working with Data Lesson B) Houghton Mifflin Text p. 42-44, 62-64, 66-67, 68-70, 72-78, 400-401 Overhead activities 2-2 2-3 2-4 2-5 Accelerated Math Obj. 172, 175 Connected Math Data About Us	*Math Test LO # 22 (See appendix) Houghton Mifflin Practice 1-17, 2-2, 2-4, 2-5, 9-6 Reteach 1-17, 2-2, 2-4, 2-5, 9-6 Challenge 1-17, 2-2, 2-4, 2-5, 9-6 Chapter Review Pg. 147, 441 Chapter Test 149, 443

Adams County/Ohio Valley
Course of Study

Content Standard: Students pose questions and collect, organize, represent, interpret and analyze data to answer those questions. Students develop and evaluate inferences, predictions and arguments that are based on data.
Benchmark: D. Compare increasingly complex displays of data, such as multiple sets of data on the same graph.
Content Organizer: ***Data Collection***

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
3. Compare representations of the same data in different types of graphs, such as a bar graph and circle graph.	Students need practice in constructing the different types of graphs: - bar graph - line graph - circle graph - pictograph - double bar graph to understand this data. When given data and constructing their own graphs along with the intention of what they are to use the graph to show, standards gain understanding of what types of graphs to use and when. Students should construct the above graphs as a project using the following data - attendance - test scores - goals for classroom - teacher generated data	Chart paper that can be posted in the room. Markers Paper for students to construct Cornerstone math working with data lesson B *Incorporated in some sheets of daily math proficiency. Accelerated math obj. 170-177 Connected Math Data About Us	Student developed graphs.

Content Standard: Students pose questions and collect, organize, represent, interpret and analyze data to answer those questions. Students develop and evaluate inferences, predictions and arguments that are based on data.
Benchmark: F. Determine and use the range, mean, median and mode to analyze and compare data, and explain what each indicates about the data.
Content Organizer: *Statistical Methods*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
4. Understand the different information provided by measures of center (mean, mode and median) and measures of spread (range). *Incorporates LO # 23 of the Ohio 6th grade proficiency test.	Students need to understand the following concepts and be able to apply them in problem solving situations. Mean – The "average" of a group or set of numbers. Median – The middle number of average of the 2 middle numbers in a set of numbers. Mode – The number that appears the most often in a set of numbers. If no numbers appear more than once, there is no mode. Range – The difference between the highest and lowest number in a group or set of numbers. NOTE: Cooperative learning activities work well with these concepts.	*TGT Math sheet LO 23 (See appendix) *Incorporated in all sheets of Daily math proficiency Houghton Mifflin Text Pg. 60-61 Overhead activities: 2-1 Extension 2-1 Accelerated Math Obj. 182-185 Connected Math Data About Us Attached Sheet	Math Test LO 23 (See appendix) Houghton Mifflin Practice 2-1 Reteach 2-1 Challenge 2-1 Attached Sheet

Content Standard: Students pose questions and collect, organize, represent, interpret and analyze data to answer those questions. Students develop and evaluate inferences, predictions and arguments that are based on data.
Benchmark: B. Interpret data by looking for patterns and relationships, draw and justify conclusions, and answer related questions.
Content Organizer: *Statistical Methods*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
5. Describe the frequency distribution of a set of data, as shown in a histogram or frequency table, by general appearance or shape, e.g., number of modes, middle of data, level of symmetry, outliers.	Students need to understand - tally marks are - frequency finding out how often data occurs in a given interval - histogram – a bar graph type of graph that displays data form the frequency table Model ways for students to display frequency of events by using overhead or large chart paper that can be hung up in the room. Have students describe a completed histogram frequency table by mode, median, range, level of symmetry.	Houghton Mifflin Text Pg. 66-67 Overhead activities: 2-3 Extra practice Text Set C Pg. 90 Accelerated Math Obj. 184 Connected Math Data About Us	Houghton Mifflin Practice 2-3 Reteach 2-3 Challenge 2-3

Content Standard: Students pose questions and collect, organize, represent, interpret and analyze data to answer those questions. Students develop and evaluate inferences, predictions and arguments that are based on data.
Benchmark: G. Evaluate conjectures and predictions based upon data presented in tables and graphs, and identify misuses of statistical data and displays.
Content Organizer: *Statistical Methods*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
6. Make logical inference from statistical data. *Incorporates LO # 5 Ohio 6th grade Proficiency Test	After teaching students to make tables, tallies to display information go to LO 5A sheet (appendix) and go through the first 2 problems with the whole class. Students need to understand in logical reasoning that you take all the information given to make reasonable deductions to justify an answer. The use of the table to display information will help students visually understand this concept. Sit students up in cooperative groups to complete the remainder of the questions and compare answers and discuss. It is very important for students to use a table to display information.	TGT Math Sheet LO 5 A (See appendix) *Incorporated in Daily Math Proficiency Houghton Mifflin Text Pg. 60-61, 76-77 (referenced) Accelerated Math Obj. 182-185 Connected Math Data About Us/How Likely Is It?	*Math Test LO 5 A (See appendix)

Content Standard: Students pose questions and collect, organize, represent, interpret and analyze data to answer those questions. Students develop and evaluate inferences, predictions and arguments that are based on data.
Benchmark: K. Make and justify predictions based on experimental and theoretical probabilities.
Content Organizer: *Probability*

Grade Level Indicator	*Instructional Activities/Strategies*	*Resources*	*Assessment*
7. Design an experiment to test a theoretical probability and explain how the results may vary. *Incorporates LO # 24 on Ohio 6th Grade Proficiency Test.	Students need to be able to use spinners, dice, cards, coins, etc. to make predictions and explain how they found their answer. Students also need to be able to interpret normation from drawings such as spinners to determine probability. In addition students need to understand these terms - experiment - event - theoretical probability - experimental probability - sample space Finally, student should be able to set up their own experiments in cooperative teams and explain why their results vary.	*TGT Math Sheets LO 24A or LO 24B (See appendix) *Incorporated in Daily Math proficiency lessons. Houghton Mifflin Text Pg. 516-518, 520-521 Overhead activities: 11-7, 11-8, 11-9, 11-10, 11-11 Extension 11-11, 11-12 Accelerated math Obj. 181 Connected Math How Likely Is It?	*Math test LO 24 (see appendix) Houghton Mifflin Practice 11-7, 11-8, 11-9, 11-10, 11-11, 11-12 Reteach 11-7, 11-8, 11-9, 11-10, 11-11, 11-12 Challenge 11-7, 11-8, 11-9, 11-10, 11-11, 11-12 and Student experiments