

**Scranton School District
Planned Course
Mathematics**

Unit: 5th Grade

Standards	Skills/Knowledge	Suggested Activities	Assessment
2.1 Numbers, Number Systems and Number Relationships	<p>A. Use expanded notation to represent whole numbers or decimals.</p> <p>B. Apply number theory concepts to rename a number quantity. (e.g. six, 6, $\frac{3}{4} \times 2$, $10 - 4$).</p> <p>C. Demonstrate that mathematical operations can represent a variety of problem situations.</p>	<ol style="list-style-type: none"> 1. Identify and write the place value for each digit in a whole number up to hundred millions. 2. Write decimals in expanded form using whole numbers, tenths, and hundredths. 3. <i>Place value charts, base ten blocks.</i> <ol style="list-style-type: none"> 1. Use commutative property, associative property and distributive property to rename number quantities. 2. <i>Worksheets, applicable Practice Book pages (Math Advantage, Harcourt Brace) daily assignments.</i> <ol style="list-style-type: none"> 1. Solve a variety of story problems using the four operation of Mathematics. 2. <i>E-Lab Software.</i> 	<p>➤ Formal assessment and teacher observations</p> <p>➤ Formal assessment and on-going teacher observations</p> <p>➤ On-going teacher observation and assessment</p>

Standards	Skills/Knowledge	Suggested Activities	Assessment
2.1 Numbers, Number Systems and Number Relationships – Con't.	<p>D. Use models to represent fractions and decimals.</p> <p>E. Explain the concepts of prime composite numbers.</p> <p>F. Use simple concepts of negative numbers (e.g., on a number line, in counting, in temperature).</p> <p>G. Develop and apply number theory concepts (e.g., primes, factors, multiples, composites) to represent numbers in various ways.</p>	<p>1. Use fraction circles, base ten blocks, decimal number line, and decimal squares to represent fractions and decimals (up to thousandths).</p> <p>1. List the prime numbers to 100. Identify whole numbers as prime or composite.</p> <p>2. Explain in writing the difference between prime and composite numbers.</p> <p>3. <i>Sieve of Eratosthenes, square tiles</i></p> <p>1. Use manipulatives such as number lines or thermometers to represent negative numbers.</p> <p>1. Factor numbers up to 100 using rules for divisibility by 2, 3, 5, 6, and 10.</p> <p>2. Use prime factors to find the greatest common factor of two numbers to 50.</p> <p>3. Use prime factors to find the least common multiple of two numbers up to 50.</p>	<p>➤ Teacher observation of classroom activities involving the use of manipulatives</p> <p>➤ Formal assessment and classroom observation</p> <p>➤ Teacher observation of classroom activities involving the use of manipulatives</p> <p>➤ Classroom activities and formal assessment</p>

Standards	Skills/Knowledge	Suggested Activities	Assessment
2.2 Computation and Estimation	A. Create and solve word problems involving addition, subtraction, multiplication and division of whole numbers.	<ol style="list-style-type: none"> 1. Story problems 2. Practice book and Mixed Applications (<i>Math Advantage, Harcourt Brace</i>). 3. Student created word problems 	➤ Teacher observation and formal assessment
	B. Develop and apply algorithms to solve word problems that involve addition, subtraction, and/or multiplication with decimals with and without regrouping.	<ol style="list-style-type: none"> 1. Practice book and mixed applications (<i>Math Advantage, Harcourt Brace</i>). 2. Student created word problems 	➤ Teacher observation and formal assessment
	C. Develop and apply algorithms to solve word problems that involve addition, subtraction, and/or multiplication with fractions and mixed numbers that include like and unlike denominators.	<ol style="list-style-type: none"> 1. Practice book and mixed applications (<i>Math Advantage, Harcourt Brace</i>). 2. Student created word problems 3. Fraction Fireworks software 	➤ Teacher observation and formal assessment
	D. Demonstrate the ability to round numbers.	<ol style="list-style-type: none"> 1. Round whole numbers up to the nearest million place and decimals to the nearest tenth, hundredth and thousandth. 2. Classroom place value chart 	➤ Teacher observation and formal assessment

Standards	Skills/Knowledge	Suggested Activities	Assessment
2.2 Computation and Estimation – Con't.	<p>E. Determine through estimations the reasonableness of answers to problems involving addition, subtraction, multiplication and division of whole numbers.</p> <p>F. Demonstrate skills for using fraction calculators to verify conjectures, confirm computations and explore complex problem-solving situations.</p> <p>G. Apply estimation strategies to a variety of problems including time and money.</p> <p>H. Explain multiplication and division algorithms.</p> <p>I. Select a method for computation and explain why it is appropriate.</p>	<p>1. Estimate by rounding or use of compatible numbers to determine the reasonableness of answers in problem solving.</p> <p>1. Fraction calculator</p> <p>1. Teacher made activities, workbook pages (<i>Math Advantage, Harcourt Brace</i>).</p> <p>1. Oral and written explanations of the involved algorithm.</p> <p>1. Select paper and pencil, mental Math or a calculator to solve a variety of problems and explain the appropriateness of using the selected method.</p>	<p>➤ Teacher observation and formal assessment</p> <p>➤ Teacher observation and formal assessment</p> <p>➤ Teacher observation and formal assessment</p> <p>➤ Teacher observation and formal assessment</p> <p>➤ Teacher observation and formal assessment</p>

Standards	Skills/Knowledge	Suggested Activities	Assessment
2.3 Measurement and Estimation	<p>A. Select and use appropriate instruments and units for measuring quantities (e.g., perimeter, volume, area, weight, time, temperature).</p> <p>B. Select and use standard tools to measure the size of figures with specified accuracy, including length, width, perimeter and area.</p> <p>C. Estimate, refine and verify specified measurements of objects.</p> <p>D. Convert linear measurements within the same system.</p> <p>E. Add and subtract measurements</p>	<p>1. Metric and English rulers, balance scales, digital and analog clocks, and Fahrenheit and Celsius thermometers, grid paper and grid transparencies.</p> <p>1. Metric and English rulers, trundle wheel, one inch grid paper and one centimeter grid paper.</p> <p>1. Metric and English rulers, capacity containers and scales.</p> <p>1. Metric and English rulers, capacity containers and scales, conversion charts.</p> <p>1. Add and subtract measurements with and without renaming.</p>	<p>➤ Teacher observation and formal assessment</p> <p>➤ Teacher observation and formal assessment</p> <p>➤ Teacher observation and formal assessment</p> <p>➤ Teacher observation and formal assessment</p> <p>➤ Teacher observation and formal assessment</p>

Standards	Skills/Knowledge	Suggested Activities	Assessment
2.5 Mathematical Problem Solving and Communication	<p>A. Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense and explain how the problem was solved.</p> <p>B. Use appropriate mathematical terms, vocabulary, language symbols and graphs to explain clear and logical solutions to problems.</p> <p>C. Show ideas in a variety of ways, including words, numbers, symbols, diagrams and models.</p>	<p>1. Demonstrate an understanding of the problem. (Retell the problem, list the pertinent information).</p> <p>2. Develop a plan to solve the problem. (List strategies, predict the answer, and make an estimate).</p> <p>3. Solve the problem. Show the solution and write the answer in a complete sentence.</p> <p>4. Look back and check the answer for accuracy. Explain the steps involved.</p> <p>1. Same as above.</p> <p>2. Explain solutions orally and in writing.</p> <p>1. Student created models (drawings, charts, graphs, tables, etc.) to represent concepts, equations and solutions to a variety of math problems.</p>	<p>➤ Formal and informal assessments and teacher observation</p> <p>➤ Formal and informal assessments and teacher observation</p> <p>➤ Formal and informal assessments and teacher observation</p>

Standards	Skills/Knowledge	Suggested Activities	Assessment
<p>2.6 Mathematical Problem Solving and Communication – Con't.</p>	<p>D. Connect, extend and generalize problem solutions to other concepts, problems and circumstances in mathematics.</p> <p>E. Select, use and justify the methods, materials and strategies used to solve problems.</p> <p>F. Use appropriate problem-solving strategies (e.g., solving a simpler problem, drawing a picture or diagram).</p>	<p>1. Orally explain the reasons for using specific methods.</p> <p>1. Given a variety of problems the student will select the appropriate strategy and apply that strategy to find the correct solution.</p>	<p>➤ Formal and informal assessments and teacher observation</p> <p>➤ Teacher observation</p> <p>➤ Formal and informal assessments and teacher observation</p>

Standards	Skills/Knowledge	Suggested Activities	Assessment
2.6 Statistics and Data Analysis	<p>A. Organize and display data using pictures, tallies, tables, charts, bar graphs and circle graphs.</p> <p>B. Describe data sets using mean, median, mode and range.</p> <p>C. Sort data using Venn diagrams.</p> <p>D. Predict the likely number of times a condition will occur based on analyzed data.</p> <p>E. Construct and defend simple conclusions based on data.</p> <p>F.</p> <p>G. Select and use appropriate strategies, including concrete materials, to solve number sentences and explain the method of solution.</p>	<p>1. Students will construct charts, line graphs, bar graphs and line plots to describe data.</p> <p>1. Given a set of data, the student will supply its mean, median, mode and range.</p> <p>1. Using Venn diagrams, students will compare and contrast data.</p> <p>1. Number cubes, coins, tree diagrams, spinners and dice will be used to predict probability.</p> <p>1. Distributive property</p> <p>2. Base ten block activity</p> <p>3. Graph paper modeling</p>	<p>➤ Teacher observation and informal assessment</p> <p>➤ Formal and informal assessments and teacher observation</p> <p>➤ Classroom observation and formal assessment</p> <p>➤ Open ended question/ answer rubric</p>

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2.6 Statistics and Data Analysis – Con't.	<p>H. Locate and identify points on a coordinate system.</p> <p>I. Generate functions from tables of data and relate data to corresponding graphs and functions.</p>	<p>1. <i>Plant Growth activity</i>, p. 163, <u>Principles and Standards graph paper</u>.</p> <p>1. <i>Plant Growth activity</i>, p. 163, <u>Principles and Standards, Table of Date and Coordinate Grid Interpretation</u>.</p>	<ul style="list-style-type: none"> ➤ Interpreting data on a coordinate grid ➤ Open ended question/ answer rubric ➤ Formal assessment

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2.7 Probability and Predictions	<p>A. Perform simulations with concrete devices (e.g., dice, spinners) to predict the chance of an event occurring.</p> <p>B. Determine the fairness of the design of the spinner.</p> <p>C. Express probabilities as fractions and decimals.</p> <p>D. Compare predictions based on theoretical probability and experimental results.</p> <p>E. Calculate the probability of a simple event.</p>	<p>1. Coin Toss Activity E62, Harcourt Enrichment</p> <p>2. Dice Activity E63, Harcourt Enrichment</p> <p>1. The probability = $\frac{\text{Number of selections}}{\text{Total number of selections}}$</p> <p>2. Write each probability as a fraction a/b.</p> <p>1. Math explorer calculator activities using F~D function key.</p> <p>1. Computer software, <u>Number Heroes</u>, Probability, Harcourt</p> <p>1. Enrichment Activity, E64, E65, Harcourt</p>	<p>➤ Teacher observation</p> <p>➤ Assessment worksheet</p> <p>➤ Formal assessment</p> <p>➤ Cooperative group activity</p> <p>➤ Teacher observation</p> <p>➤ Teacher Observation</p> <p>➤ Formal assessment</p>

Standards	Skills/Knowledge	Suggested Activities	Assessment
2.7 Probability and Predictions – Con't.	<p>F. Determine patterns generated as a result of an experiment.</p> <p>G. Determine the probability of an event involving “and”, “or”, or “not”.</p> <p>H. Predict and determine why some outcomes are certain, more likely, less likely or impossible.</p> <p>I. Find all possible combinations and arrangements involving a limited number of variables.</p> <p>J. Develop a tree diagram and list elements.</p>	<p>1. Students create and interpret a table in which they organize data from an experiment.</p> <p>1. Define terms</p> <p>2. Write sentences using “and”, “or”, and “not” based on student spinner simulation activity.</p> <p>1. Math journals – define terms and give examples of each term.</p> <p>2. Enrichment activity, E66, Harcourt</p> <p>1. Students make an organized list of data (all possible outcomes).</p> <p>1. Math journals – define term and draw illustration.</p> <p>2. Students develop problems involving multiple combinations and illustrate as a tree diagram.</p> <p>3. Students list outcomes.</p>	<p>➤ Teacher observation</p> <p>➤ Worksheet activity</p> <p>➤ Worksheet activity</p> <p>➤ Word search or crossword puzzle, puzzlemaker.com</p> <p>➤ Worksheet activity</p> <p>➤ Teacher observation of students in cooperative groups</p> <p>➤ Student activity</p> <p>➤ Teacher formal assessment</p>

Standards	Skills/Knowledge	Suggested Activities	Assessment
2.8 Algebra and Functions	<p>A. Recognize, reproduce, extend, create, and describe patterns, sequences and relationships verbally, numerically, symbolically, and graphically, using a variety of materials.</p> <p>B. Connect patterns to geometric relations and basic number skills.</p> <p>C. Form rules based on patterns (e.g. an equation that relates pairs in a sequence).</p> <p>D. Use concrete objects and combinations of symbols and numbers to create expressions that model mathematical situations.</p>	<p>1. Express “growing squares” as mathematical sentences. p151, <u>Principles and Standards</u></p> <p>1. Use “growing squares” model to predicate area. Extend the pattern.</p> <p>1. Number patterns – find the next three terms. Write the rule. E49, Harcourt</p> <p>1. Rectangular multiplication, base ten blocks. p161, <u>Principles and Standards</u></p> <p>2. Commutative Property Practice</p> <p>3. Distributive Property Practice</p>	<p>➤ Teacher observation</p> <p>➤ Dot paper sheet</p> <p>➤ Graph paper activity</p> <p>➤ Activity sheet</p> <p>➤ Cooperative team activity</p> <p>➤ Base ten block activity</p> <p>➤ Cooperative team activity</p> <p>➤ Teacher observation</p>

Standards	Skills/Knowledge	Suggested Activities	Assessment
2.8 Algebra and Functions – Con't.	<p>E. Explain the use of combinations of symbols and numbers in expressions, equations and inequalities.</p> <p>F. Describe realistic situation using information given in equations, inequalities, tables or graphs.</p>	<p>1. <i>Surface Area Activity</i> p.p.160-162 Tower of Cubes <u>Principles and Standards</u> $S = 4 \times n + 2$</p> <p>1. <i>Plant Growth Activity</i> p.163, <u>Principles and Standards</u></p>	<ul style="list-style-type: none"> ➤ Teacher observation ➤ Cooperative team activity ➤ Modeling ➤ Open-ended question/ answer rubric. Samples in Performance Assessment

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2.9 Geometry	<p>A. Give formal definition of geometry.</p> <p>B. Classify and compare triangles and quadrilaterals according to sides or angles.</p> <p>C. Identify and measure circles, their diameters and their radii.</p> <p>D. Describe in words how geometric shapes are constructed.</p> <p>E. Construct two and three dimensional shapes and figures using manipulatives, geoboards and computer software.</p>	<p>1. Glossary</p> <p>2. Journal</p> <p>1. Triangle Land Activity</p> <p>2. Measure Me Activity (E138, E139) Harcourt Brace</p> <p>1. Pattern Block activity, Non-standard unit of measure to find patterns in angle, sums of polygons. (tan pattern blocks)</p> <p>1. <i>Number Heroes Geocomputer</i> Nest of geometric shapes to be constructed by students. Students describe in written form step by step instructions for shape construction. Harcourt Brace Software</p> <p>2. Journal</p> <p>1. <i>Geocomputer</i> Activities, Harcourt Brace Software</p> <p>2. Geoboard and Dot Paper Activities.</p> <p>3. Pattern Block Modeling</p>	<p>➤ Vocabulary word search</p> <p>➤ Crossword puzzle</p> <p>➤ Activity sheets</p> <p>➤ Teacher observation</p> <p>➤ Teacher observation</p> <p>➤ Activity sheet</p> <p>➤ Rubric performance assessment</p> <p>➤ Teacher observation</p>

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2.9 Geometry – Con't.	<p>F. Find familiar solids in the environment and describe them.</p> <p>G. Create an original tessellation.</p> <p>H. Describe the relationship between the perimeter and area of triangles, quadrilaterals and circles.</p> <p>I. Represent and use concepts of line, point and plane.</p>	<p>1. Writing activity</p> <p>2. Glossary</p> <p>3. Journal</p> <p>1. Pattern block activity</p> <p>1. Discovering area with tangrams. (Use smallest triangles to construct squares and parallelograms).</p> <p>2. Explore area and perimeter geoboard activities. <u>Mathematics Methods for Elementary and Middle School Teachers 4/e p. 129.</u> Hatfield/Edwards/Bitter/Morrow</p> <p>3. Journals</p> <p>1. E133, <i>What's the Point</i> Harcourt</p> <p>2. Journals</p> <p>3. Glossary</p>	<p>➤ Rubric</p> <p>➤ Teacher observation</p> <p>➤ Teacher observation</p> <p>➤ Activity sheet</p> <p>➤ Word search</p> <p>➤ Crossword puzzle</p>

Standards	Skills/Knowledge	Suggested Activities	Assessment
2.9 Geometry – Con't.	<p>J. Define the basic properties of squares, pyramids, parallelograms, trapezoids, polygons, rectangles, rhombi, circles, triangles, cubes, prisms, spheres and cylinders.</p> <p>K. Analyze simple transformations of geometric figures and rotations of line segments.</p> <p>L. Identify properties of geometric figures (e.g., parallel, perpendicular, similar, congruent and symmetrical).</p>	<p>1. Geocomputer Harcourt software</p> <p>2. Geoboard activities</p> <p>3. Journals – correctly draw and describe</p> <p>4. Glossary</p> <p>5. <i>Polygons in Circles Activity</i>, Cuisenaire, <u>Start with Manipulatives</u>.</p> <p>1. <i>How Did I Get Here? Activity</i>, E142, Harcourt.</p> <p>2. <u>Number Heroes</u>, Geocomputer Software, Harcourt</p> <p>3. E-Lab Activity 24, Harcourt software.</p> <p>1. <i>Pattern Building Game</i>, <u>Start with Manipulatives</u>, Cuisenaire</p>	<p>➤ Formal assessment</p> <p>➤ Student/Teacher interview</p> <p>➤ Activity sheets</p> <p>➤ Identify geometric figures and write a definition for each figure.</p>

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2.10 Trigonometry	<p>A. Identify and compare parts of right triangles, including right angles, acute angles, hypotenuses and legs.</p> <p>B. Create right triangles on a geoboard.</p>	<p>1. Geoboard Activities, Pythagorean theorem $a^2 + b^2 = c^2$</p> <p>2. Make the smallest right triangle possible. Find the area. $A = \frac{1}{2} b \times h$ Construct a square on each side of the triangle. Find the area of each square. $A = \text{length} \times \text{width}$. What is the relationship between these areas?</p> <p>1. Geoboard Activity</p>	<p>➤ Teacher observation</p> <p>➤ Modeling by student</p> <p>➤ Math journal</p> <p>➤ Identify right triangle</p>

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2.11 Concepts of Calculus	<p>A. Make comparisons of numbers (e.g., more, less, same, least, most, greater than, less than).</p> <p>B. Identify least and greatest values represented in bar and circle graphs.</p> <p>C. Identify maximum and minimum.</p> <p>D. Describe the relationship between rates of change and time.</p> <p>E. Estimate areas and volumes as the sums of areas of tiles and volumes of cubes.</p> <p>F. Describe the relationship between the size of the unit of measurement and the estimate of the areas and volumes.</p>	<p>1. Practice writing sentences comparing data with the > and <.</p> <p>1. Students write sentences with < and > comparing least and greatest values on bar graphs and circle graphs.</p> <p>1. Plot the maximum and minimum values on a graph.</p> <p>1. Line graph activity; Plot the attendance for 6 months at a baseball stadium. Create a table displaying the data.</p> <p>1. Patterns with cubes. 2. <i>Share and Share Alike</i>, E77, Harcourt</p> <p>1. Color tiles activity, Students explore and analyze $A = L \times W$. 2. Students explore and discover $V = L \times W \times H$. 3. Compare square units and cubic units 4. Estimation skills Tasks 5. Compare cm with cm . Make predictions of areas and volumes of models.</p>	<p>➤ Teacher observation ➤ Dot paper sheet</p> <p>➤ Graph paper activity</p> <p>➤ Activity sheet ➤ Cooperative team act</p> <p>➤ Base ten block activity ➤ Cooperative team activity ➤ Teacher observation</p> <p>➤ Teacher observation ➤ Cooperative team ➤ Modeling</p> <p>➤ Open-ended question/answer rubric. Samples in Performance Assessment</p>

