SPRUCE STREET SCHOOL PILOT MATH CONTINUUM

Preconventional	Emerging	Developing	Beginning	Expanding
1 Counts orally to 10 1 Explores one to one correspondence	1 Demonstrates one to one correspondence when counting object. 1 Connects number words and numerals to the quantities they represent. 1 Understands relationship of parts to whole	1 Compares groups of objects using less than, more than and equal to 1 Demonstrates understanding of simple fractions (1/2, 1/3, 1/4) using pictures or manipulatives 1 Begins to skip count by 2's, 5's and 10's 1 Demonstrates understanding of place value using tens and ones.	1 Mentally holds a number constant while counting 1 Interprets and records subtraction equations made by manipulating objects 1 Uses skip-counting (by 2's, 5's and 10's) to count objects. 1 Demonstrates understanding of 3 digit place value 1 Relates pictures to symbols of 1/2, 1/3 and 1/4 1 Multiplies using repeat addition 1 Interprets and records multiplication equations made by manipulating objects	1 Develops and uses multiple strategies for addition and subtraction with whole numbers 1 Begins to apply multiplication facts 1 Recognizes numbers up to 1000 1 Demonstrates fluency with basic addition and subtraction facts 1 Interprets and records division equations made by manipulating objects 1 Understands pictorial and symbolic representation of fractions 1 Begins to recognize equivalent fractions with pictures or manipulatives 1 Begins to add fractions with like denominators 1 Demonstrates understanding of place value in whole numbers (four digits and beyond) 1 Uses groups to solve and record multiplication problems
Explores measurement using nonstandard units (body parts, etc.) Uses language to describe size, temperature, speed etc.	Uses comparative language (longer, lighter, colder, etc.) Uses non-standard units (body parts, manipulatives) to measure length, width and height with guidance Explores area, perimeter and volume (how much sand will this cup hold?) Recognizes some coins Begins to relate time to own life (calendar, clock)	Uses nonstandard units to measure, compare and estimate measurements Understands that there are tools for measurement (clocks, scales, rulers) Begins to measure area and perimeter Uses time vocabulary (yesterday, tomorrow, now, later) Identifies pennies, nickels, dimes, and quarters	Begins to use tools for standard US and metric measures Finds area and perimeter using nonstandard units Identifies value of coins and bills Tells time by hour and half hour (analog)	Finds area and perimeter using standard units Counts money in combination to a dollar Measures length, weight and volume with standard U.S. and metric units of measure Shows and tells time to nearest 15 minutes
Recognizes simple shapes (circles, squares, triangles, rectangles) Draws simple shapes (circles, squares, triangles, rectangles)	Recognizes and names basic geometric shapes in the environment Begins to describe relative location of objects (above, below, beside etc.)	Combines 2D shapes to form different shapes Recognizes basic 3D shapes Begins to build symmetrically Sorts objects by two or more attributes	Divides 2D shapes to form different shapes Identifies and creates single line of symmetry Names basic 3D shapes (such as cube, sphere, pyramid, prism and cone)	Begins to use vocabulary for attributes of 2D and 3D shapes (e.g. side, face, corner) Identifies 2D shapes in a variety of orientations Begins to use ordered pairs to locate points on a coordinate grid
Sorts concrete objects by one attribute Graphs concrete objects with guidance	Predicts, collects numerical data and reports findings verbally Sorts objects by two attributes Sorts information using intersecting graphs (such as Venn diagrams) with guidance	Observes and discusses information found on simple graphs and charts Sorts information using intersecting graphs (such as Venn diagrams) independently	Reads, interprets, and makes inferences based on simple graphs and charts Represents data in graphs and charts with guidance Demonstrates an understanding of the notions: certain, impossible, more likely, and less likely Makes predictions based on data	Organizes bar and pictorial graphs to explain an event. Compares and analyzes information presented in bar, circle, line and pictorial graphs, charts and tables. Collects and organizes data systematically with guidance.
Looks for and discovers patterns in the environment	Recognizes and extends patterns Understands and uses ordinal numbers "first" through "fifth"	Copies, extends, and explains repeating patterns using symbolic forms Finds a variety of groupings that equal a single total (such as combinations of ten.) Identifies ordinal numbers to 10	Creates and extends simple increasing patterns Represents patterns pictorially and symbolically	Fills in missing numbers in simple equations (such as 2 + ___=5).
Begins to recognize and write numerals Begins to connect number words and numerals to the quantities they represent. Represents quantities pictorially	Reflects and explains mathematical thinking verbally and pictorially Creates pictorial graphs with guidance Explores mathematical symbols and equations Recognizes numerals up to 10 Writes numerals up to 10 Connects number words and numerals to the quantities they represent	Interprets and records 2 digit numbers Identifies problem to be solved in simple, single-step situations Begins to use words to record mathematical thinking. Recognizes, interprets and records numeric equations using +, - and = symbols	Identifies problem to be solved in simple story problems Recognizes different situations which require addition and subtraction Writes appropriate addition and subtraction equations as a part of mathematical explanations Begins to explain mathematical thinking in writing Recognizes and interprets > and < symbols.	Identifies problem to be solved in multi-step problems requiring addition and subtraction Solves two-step problems using addition and subtraction. Explains mathematical thinking using words, pictures, and addition and subtraction equations. Begins to assess whether answers are reasonable. Understands situations that entail multiplication and division, such as equal groupings of objects and sharing equally.

1 Number Sense and Computation Measurement Geometry and Spatial Sense Probability and Data Analysis Function and Relationships/Patterns Problem Solving and Communication

SPRUCE STREET SCHOOL PILOT MATH CONTINUUM

Bridging	Fluent	Proficient	Connecting	Analytical
Solves addition problems using regrouping efficiently and accurately Begins to multiply two digit by two digit numbers using partial products. Adds and subtracts fractions with like denominators Begins to interpret improper fractions and mixed numbers Recognizes and generates equivalent fractions Shows understanding of fractions as parts of collections as well as divisions of whole numbers. Explores negative numbers	Solves subtraction problems involving regrouping efficiently and accurately. Solves two or more digit multiplication problems using partial products. Demonstrates fluency with multiplication facts Begins to solve two digit division problems using partial products. Begins to apply division facts Adds and subtracts basic fractions with unlike denominators (halves, thirds, fourths, fifths, sixths, eighths, tenths) Recognizes equivalencies among commonly used fractions, decimals and percents. Identifies factors and multiples	Solves multi-digit multiplication problems efficiently and accurately Solves two or more digit division problems using partial products. Demonstrates fluency with division facts Multiplies fractions by whole numbers Begins to divide whole numbers by fractions Operates with decimals. Describe classes of numbers according to characteristics such as the nature of their factors (such as multiples of seven, or prime numbers)	Solves multi-digit division problems efficiently and accurately Uses proportional reasoning to solve problems Works flexibly with fractions, decimals and percents to solve problems Computes efficiently and accurately using fractions, percents and decimals. Develops understanding of percents greater than 100 and less than 1	Applies associative and commutative laws to problem solve and check work Develops an understanding of large numbers Recognizes and uses exponential, scientific and calculator notation
Begins to perform simple conversions between measurement units (ft to in, cm to m, etc.) Makes reasonable estimates for length, area and perimeter Begins to choose measurement tools and computation procedures to solve problems	Performs simple conversions between measurement units (hour to minutes, ft to in, etc.) Generalizes and applies rules for area and perimeter Begins to find volume and surface area Accurately tells time	Generalizes and applies rules for volume and surface area Uses measurement tools to measure to the nearest unit (e.g. uses ruler to measure to nearest millimeter.) Begins to measure and create a scale in maps or drawings [and understands concept of a constant ratio.]	Uses measurement tools routinely, skillfully and accurately. Measures mass, capacity and temperature using appropriate units. Understands relationship between area, perimeter and volume.	Understands concept of rate Measures and creates a scale on maps or drawings and understands concept of a constant ratio. Uses ratio and proportion to determine appropriate scale. Selects and uses tools and units that provide an appropriate degree of precision. Understands relationships between US and metric systems
Begins to use ordered pairs with both positive and negative numbers to locate points on a coordinate grid Develops and articulates rules for simple geometric shapes Begins to identify specific polygons (e.g. equilateral triangle, parallelogram)	Compares, contrasts, measures and identifies angles, including landmark angles such as 30, 45 and 90. Identifies transformations (translations, reflections, rotations and enlargements) Identifies symmetry, similarity and congruency among shapes	Uses ordered pairs to locate points on a coordinate grid Identifies and classifies parallel and perpendicular lines, acute, obtuse and right angles Constructs symmetric, congruent and similar geometric shapes.	Identifies and creates angles according to their properties Identifies basic polyhedra Constructs geometric figures in 2-D and 3-D accurately and independently.	Understands and constructs simple geometric transformations using combinations of slides, flips and turns. Applies effective procedures for computing perimeter and area of parallelograms, rectangles, triangles and circles. Measures, deduces and calculates angles in plane figures.
Displays data in numerical and graphic forms Interprets data from graphs, making inferences and noting generalities Uses past experience to make predictions about simple events involving chance Understands what it means for events to be equally likely and for a game or process to be fair	Collects and organizes data independently Makes statements and draws conclusions based on data Predicts and determines why some outcomes are equally likely, more likely, or less likely than others Considers size in determining statistical sample reliability	Organizes and displays data in tables, charts, and graphs independently Finds range, median and mode of data set.	Conducts experiments and simulations listing outcomes and computing experimental probability Demonstrates understanding of representative and random samples Understands and generates multiple interpretations of data) Calculates and applies measures of central tendency (mean, median, and mode)	Uses organizational tools (matrix, tree diagram, and systematic lists) to count outcomes and determine probability Creates a data analysis investigation: considers problem, collects and records data, describes and interprets data, and develops hypotheses or theories based on data Able to display data in a variety of forms and choose most appropriate for a given situation
Recognizes letters, boxes, or other symbols to stand for unknown numbers Examines patterns and relationships on T charts to make predictions and generalizations	Recognizes and uses letters, boxes, or other symbols to represent unknown numbers Writes rules for simple numerical patterns	Looks for and uses patterns as a strategy to solve problems	Expresses pattern problems as formulas. Creates and uses tables and graphs to represent relationships Uses variables in simple expressions, equations and inequalities.	Finds and writes function rules for linear and simple exponential relationships Represents functions in tables and graphs Sets up and solves single variable equations and inequalities Understands rate of change (slope of line, constant rate of change) Understands concept of linear and proportional change
Explains mathematical thinking using words, models and mathematical notation as appropriate.	Recognizes relevant and irrelevant information Makes conjectures and inferences based on prior mathematical knowledge and experiences Uses estimation strategies to determine if answers are reasonable	Implements efficient strategies for solving open-ended problems Makes and investigates mathematical conjectures Uses multiple strategies to check work for accuracy.	Tests conjectures by finding examples to support or contradict Checks answers for reasonability consistently and independently	Applies a wide variety of strategies to solve problems and adapts strategies to new situations Expresses mathematical thinking using appropriate mathematical notation, charts, and graphs Makes and tests conjectures when faced with complex, non-routine problems

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