

Marketplace for Kids (Project Students) Meet the Following Mathematics Standards and Benchmarks ~ Grade 4

| National Content Standards for Entrepreneurship Education | North Dakota Standards and Benchmarks | National Education Mathematics Standards for Students |
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| | <p>Mathematics (April 2005) Grade 4</p> <p>Standard 1: Numbers and Operations: Students understand and use basic and advanced concepts of number and number systems</p> <p>Numbers, Number Relationships, and Number Systems:</p> <p>4.1.8 Use appropriate terms when communicating about computations; i.e. numerator and denominator</p> <p>4.1.9 Explain the meaning of remainders in real-world situations</p> <p>4.1.10 Determine what information is relevant for solving a problem</p> <p>4.1.11 Use a variety of strategies to solve problems; i.e., guess and check, work backwards, draw pictures, use objects</p> | <p>Numbers and Operations Grades 3-5</p> <p>NM-NUM.3-5.1 Understand numbers, ways of representing numbers, relationships among numbers, and number systems.</p> <ul style="list-style-type: none"> • Understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals; • Recognize equivalent representations for the same number and generate them by decomposing and composing numbers; • Develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, as divisions of whole numbers; • Use models, benchmarks, and equivalent forms to judge the size of fractions; • Recognize and generate equivalent forms of commonly used fractions, decimals, and percents; • Explore numbers less than 0 by extending the number line and through familiar applications; • Describe classes of numbers according to characteristics such as the nature of their factors. <p>NM-NUM.3-5.2 Understand meanings of operations and how they relate to one another.</p> <ul style="list-style-type: none"> • Understand various meanings of multiplication and division; • Understand the effects of multiplying and dividing whole numbers; • Identify and use relationships between operations, such as division as the inverse of multiplication, to solve problems; • Understand and use properties of operations, such as the distributivity of multiplication over addition. <p>NM-NUM.3-5.3 Compute fluently and make reasonable estimates.</p> <ul style="list-style-type: none"> • Develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems, such as 30x50; • Develop fluency in adding, subtracting, multiplying, and dividing whole numbers; • Develop and use strategies to estimate the results of whole-number computations and to judge the reasonableness of such results; • Develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience; • Use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals; • Select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tools. |

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| | <p>Standard 2: Geometry and Spatial Sense: Student understands and applies geometric concepts and spatial relationships to represent and solve problems in mathematical and nonmathematical situations</p> <p>Two- and Three-Dimensional Shapes, Geometric Properties and Relationships: 4.2.1 Analyze the attributes of two- and three-dimensional shapes (i.e., circle, squares, trapezoid, rhombus) and use vocabulary to describe the attributes 4.2.2 Identify, describe, and model (e.g., using straws or other materials) parallel, perpendicular, and intersecting lines and line segments</p> <p>Coordinate Geometry No new expectations at this level (See grade 3)</p> <p>Transformation and Symmetry 4.2.3 Recognize the changes in position and orientation of two-dimensional figures after transformations; i.e., flips (reflections), turns (rotations), and slides (translations) 4.2.4 Use motion geometry to show that shapes are congruent or similar</p> <p>Visualization, Spatial Reasoning, and Geometric Modeling No new expectations at this level</p> | <p>Geometry Grades 3-5</p> <p>NM-GEO.3-5.1 Analyze characteristics and properties of two-and three-dimensional geometric shapes and develop mathematical arguments about geometric relationship.</p> <ul style="list-style-type: none"> • Identify, compare, and analyze attributes of two-and three-dimensional shapes and develop vocabulary to describe the attributes; • Classify two-and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids; • Investigate, describe, and reason about the results of subdividing, combining, and transforming shapes; • Explore congruence and similarity; • Make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions. <p>NM-GEO.3-5.2 Specify locations and describe spatial relationships using coordinate geometry and other representational systems.</p> <ul style="list-style-type: none"> • Describe location and movement using common language and geometric vocabulary; • Make and use coordinate systems to specify locations and to describe paths; • Find the distance between points along horizontal and vertical lines of a coordinate system. <p>NM-GEO.3-5.3 Apply transformations and use symmetry to analyze mathematical situations.</p> <ul style="list-style-type: none"> • Predict and describe the results of sliding, flipping, and turning two-dimensional shapes; • Describe a motion or a series of motions that will show that two shapes are congruent; • Identify and describe line and rotational symmetry in two- and three-dimensional shapes and designs. <p>NM-GEO.3-5.4 Use visualization, spatial reasoning, and geometric modeling to solve problems.</p> <ul style="list-style-type: none"> • Build and draw geometric objects; • Create and describe mental images of objects, patterns, and paths; • Identify and build a three-dimensional object from two-dimensional representations of that object; • Identify and draw a two-dimensional representation of a three-dimensional object; • Use geometric models to solve problems in other areas of mathematics, such as number and measurement; • Recognize geometric ideas and relationship and apply them to other disciplines and to problems that arise in the classroom or in everyday life. |

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| | <p>Standard 3: Students use data collection and analysis techniques, statistical methods, and probability to solve problems</p> <p>Data Collection, Display, and Interpretation 4.3.1. Determine a sample group to survey 4.3.2. Collect and record data 4.3.3. Organize and display data in line graphs and circle graphs 4.3.4. Read, interpret, and generate questions from data displayed in graphs; i.e., line graphs and circle graphs 4.3.5. Use computers and spreadsheets to organize and display data 4.3.6. Use number lines and coordinate graphs to represent data</p> <p>Probability 4.3.7. Conduct simple probability experiments</p> <p>Predictions, Data Analysis and Inferences 4.3.9. Make predictions and draw conclusions from simple probability experiments</p> | <p>Data Analysis & Probability Grades 3-5</p> <p>NM-DATA.3-5.1 Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer.</p> <ul style="list-style-type: none"> • Design investigations to address a question and consider how data-collection methods affect the nature of the data set; • Collect data using observations, surveys, and experiments; • Represent data using tables and graphs such as line plots, bar graphs, and line graphs; • Recognize the differences in representing categorical and numerical data. <p>NM-DATA.3-5.2 Select and use appropriate statistical methods to analyze data.</p> <ul style="list-style-type: none"> • Describe the shape and important features of a set of data and compare related data sets, with an emphasis on how the data are distributed; • Use measures of center, focusing on the median, and understand what each does and does not indicate about the data set; • Compare different representations of the same data and evaluate how well each representation shows important aspects of the data. <p>NM-DATA.3-5.3 Develop and evaluate inferences and predictions that are based on data.</p> <ul style="list-style-type: none"> • Propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions. <p>NM-DATA.3-5.4 Understand and apply basic concepts of probability.</p> <ul style="list-style-type: none"> • Describe events as likely or unlikely and discuss the degree of likelihood using such words as certain, equally likely, and impossible; • Predict the probability of outcomes of simple experiments and test the predictions; • Understand that the measure of the likelihood of an event can be represented by a number from 0 to 1. |

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| | <p>Standard 4: Students use concepts and tools of measurement to describe and quantify the world</p> <p>Measurable Attributes, Measurement Systems and Units</p> <p>4.4.1. State specific relationships between units within the same measuring system; i.e., feet to yards, minutes to hours, milliliters to liters</p> <p>4.4.2. Estimate and measure length to the nearest quarter inch</p> <p>4.4.3. Analyze relationships between perimeter and area</p> <p>4.4.4. Make change up to \$20</p> <p>4.4.5. Apply the concept of elapsed time; i.e., schedules, and calendars</p> <p>Measurement Tools, Techniques, and Formulas</p> <p>4.4.6. Select appropriate units for measuring perimeter, area, and volume</p> | <p>Measurement Grades 3-5</p> <p>NM-MEA.3-5.1 Understand measurable attributes of objects and the units, systems, and processes of measurement.</p> <ul style="list-style-type: none"> • Understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute; • Understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems; • Carry out simple unit conversions, such as from centimeters to meters, within a system of measurement; • Understand that measurements are approximations and how differences in units affect precision; • Explore what happens to measurements of a two-dimensional shape such as its perimeter and area when the shape is changed in some way. <p>NM-MEA.3-5.2 Apply appropriate techniques, tools, and formulas to determine measurements.</p> <ul style="list-style-type: none"> • Develop strategies for estimating the perimeters, areas, and volumes of irregular shapes; • Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles; • Select and use benchmarks to estimate measurements; • Develop, understand, and use formulas to find the area of rectangles and related triangles and parallelograms; • Develop strategies to determine the surface areas and volumes of rectangular solids. |

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| | <p>Standard 5: Algebra, Functions, and Patterns: Students use algebraic concepts, functions, patterns, and relationships to solve problems</p> <p>Mathematical Modeling 4.5.3. Solve problems with variables</p> | <p>Algebra Grades 3-5</p> <p>NM-ALG.3-5.1 Understand patterns, relations, and functions.</p> <ul style="list-style-type: none"> Describe, extend, and make generalizations about geometric and numeric patterns; Represent and analyze patterns and functions, using words, tables, and graphs. <p>NM-ALG.3-5.2 Represent and analyze mathematical situations and structures using algebraic symbols.</p> <ul style="list-style-type: none"> Identify such properties as commutativity, associativity, and distributivity and use them to compute with whole numbers; Represent the idea of a variable as an unknown quantity using a letter or a symbol; Express mathematical relationships using equations. <p>NM-ALG.3-5.3 Use mathematical models to represent and understand quantitative relationships.</p> <ul style="list-style-type: none"> Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions. <p>NM-ALG.3-5.4 Analyze change in various contexts.</p> <ul style="list-style-type: none"> Investigate how a change in one variable relates to a change in a second variable; Identify and describe situations with constant or varying rates of change and compare them. |
| <p>Communication and Interpersonal Skills Fundamentals of Communication</p> <p>D. 14 Prepare simple written reports</p> <p>D.08 Make oral presentations</p> <p>D.03 Use proper grammar and vocabulary</p> | | <p>Communication Pre-K-12</p> <p>Instructional programs from pre-kindergarten through grade 12 should enable all students to</p> <ul style="list-style-type: none"> NM-PROB.COMM.PK-12.1: Organize and consolidate their mathematical thinking through communication; NM-PROB.COMM.PK-12.2: Communicate their mathematical thinking coherently and clearly to peers, teachers, and others; NM-PROB.COMM.PK-12.3: Analyze and evaluate the mathematical thinking and strategies of others; NM-PROB.COMM.PK-12.4: Use the language of mathematics to express mathematical ideas precisely. |
| | | <p>Connections Pre-K-12</p> <p>Instructional programs from pre-kindergarten through grade 12 should enable all students to</p> <ul style="list-style-type: none"> NM-PROB.CONN.PK-12.1: Recognize and use connections among mathematical ideas; NM-PROB.CONN.PK-12.2: Understand how mathematical ideas interconnect and build on one another to produce a coherent whole; NM-PROB.CONN.PK-12.3: Recognize and apply mathematics in contexts outside of mathematics. |

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| | | <p>Problem Solving Pre-K-12</p> <p>Instructional programs from pre-kindergarten through grade 12 should enable all students to</p> <ul style="list-style-type: none"> • NM-PROB.PK-12.1: Build new mathematical knowledge through problem solving; • NM-PROB.PK-12.2: Solve problems that arise in mathematics and in other contexts; • NM-PROB.PK-12.3: Apply and adapt a variety of appropriate strategies to solve problems; • NM-PROB.PK-12.4: Monitor and reflect on the process of mathematical problem solving. |
| | | <p>Reasoning & Proof Pre-K-12</p> <p>Instructional programs from pre-kindergarten through grade 12 should enable all students to</p> <ul style="list-style-type: none"> • NM-PROB.REA.PK-12.1: Recognize reasoning and proof as fundamental aspects of mathematics; • NM-PROB.REA.PK-12.2: Make and investigate mathematical conjectures; • NM-PROB.REA.PK-12.3: Develop and evaluate mathematical arguments and proofs; • NM-PROB.REA.PK-12.4: Select and use various types of reasoning and methods of proof. |
| | | <p>Representation Pre-K-12</p> <p>Instructional programs from pre-kindergarten through grade 12 should enable all students to</p> <ul style="list-style-type: none"> • NM-PROB.REP.PK-12.1: Create and use representations to organize, record, and communicate mathematical ideas; • NM-PROB.REP.PK-12.2: Select, apply, and translate among mathematical representations to solve problems; • NM-PROB.REP.PK-12.3: Use representations to model and interpret physical, social and mathematical phenomena. |