Grade 5 Number strand

Outcome	Achievement Indicators
5.N.1. Represent and describe whole numbers to 1 000 000.	➢ Write a numeral using proper spacing without commas (e.g., 934 567). ➢ Describe the pattern of adjacent place positions moving from right to left. ➢ Describe the meaning of each digit in a numeral. ➢ Provide examples of large numbers used in print or electronic media. ➢ Express a numeral in expanded notation (e.g., 45 321 = [4 × 10 000] + [5 × 1000] + [3 × 100] + [2 × 10] + [1 × 1] or 40 000 + 5000 + 300 + 20 + 1). ➢ Write the numeral represented by expanded notation.
5.N.2. Apply estimation strategies including • front-end rounding • compensation • compatible numbers in problem-solving contexts.	➢ Provide a context for when estimation is used to • make predictions • check reasonableness of an answer • determine approximate answers. ➢ Describe contexts in which overestimating is important. ➢ Determine the approximate solution to a problem not requiring an exact answer. ➢ Estimate a sum or product using compatible numbers. ➢ Estimate the solution to a problem using compensation, and explain the reason for compensation. ➢ Select and use an estimation strategy to solve a problem. ➢ Apply front-end rounding to estimate • sums (e.g., 253 + 615 is more than 200 + 600 = 800) • differences (e.g., 974 – 250 is close to 900 – 200 = 700) • products (e.g., the product of 23 × 24 is greater than 20 × 20 [400] and less than 25 × 25 [625]) • quotients (e.g., the quotient of 831 ÷ 4 is greater than 800 ÷ 4 [200]

5.N.3 Determine multiplication facts (to 81) and related division facts	➢ Describe the mental mathematics strategy used to determine a basic fact, such as o skip-count up by one or two groups from a known fact (e.g., if 5 × 7 = 35, then 6 × 7 is equal to 35+7 and 7×7 is equal to 35+7+7) o skip-count down by one or two groups from a known fact (e.g., if 8 × 8 = 64, then 7 × 8 is equal to64–8and6×8isequalto64–8–8) I doubling(e.g.,for8×3think4×3=12,and8×3=12+12) o patterns when multiplying by 9 (e.g., for 9×, think 10×6 = 60, and 60 –6 = 54; for 7×9, think 7×10 = 70, and 70 – 7 = 63) o repeated doubling (e.g., if 2×6 is equal to 12, then 4×6 is equal to 24, and 8×6 is equal to 48) o repeated halving (e.g., for 60÷4, think 60÷2 = 30 and 30÷2 = 15) ➢ Recall the multiples of 0, 1, 2, 3, and 5 to 81 and related division facts. I ➢ Recall the multiplication facts that are squares: 1×1, 2×2,... up to 9×9).
5.N.4. Apply mental mathematics strategies for multiplication, such as • annexing then adding zeroes • halving and doubling • using the distributive property	➢ Determine the products when one factor is a multiple of 10, 100, or 1000 by annexing zero or adding zeros (e.g., for 3 × 200 think 3 × 2 and then add two zeros). ➢ Apply halving and doubling when determining a given product (e.g., 32 × 5 is the same as 16 × 10). ➢ Apply the distributive property to determine a given product involving multiplying factors that are close to multiples of 10 (e.g., 98 × 7 = [100 × 7] – [2 × 7]).
5.N.5. Demonstrate an understanding of multiplication (2-digit numerals by 2-digit numerals) to solve problems.	➢ Illustrate partial products in expanded notation for both factors (e.g., for 36 × 42, determine the partial products for [30 + 6] × [40 + 2]). ➢ Represent both 2-digit factors in expanded notation to illustrate the distributive property (e.g., to determine the partial products of 36 × 42, [30 + 6] × [40 + 2] = 30 × 40 + 30 × 2 + 6 × 40 + 6 × 2 = 1200 + 60 + 240 + 12 = 1512). ➢ Model the steps for multiplying 2-digit factors using an array and base-10 blocks, and record the process symbolically. ➢ Describe a solution procedure for determining the product of two 2-digit factors using a pictorial representation, such as an area model. ➢ Solve a multiplication problem in context using personal strategies, and record the process.

5.N.6. Demonstrate an understanding of division (3-digit numerals by 1-digit numerals) with and without concrete materials, and interpret remainders to solve problems.	➢ Model the division process as equal sharing using base-10 blocks, and record it symbolically. ➢ Explain that the interpretation of a remainder depends on the context: • ignore the remainder (e.g., making teams of 4 from 22 people) • round up the quotient (e.g., the number of five passenger cars required to transport 13 people) • express remainders as fractions (e.g., five apples shared by two people) • express remainders as decimals (e.g., measurement and money) ➢ Solve a division problem in context using personal strategies, and record the process.
5.N.7. Demonstrate an understanding of fractions by using concrete and pictorial representations to • create sets of equivalent fractions • compare fractions with like and unlike denominators	➢ Create a set of equivalent fractions and explain why there are many equivalent fractions for any given fraction using concrete materials. ➢ Model and explain that equivalent fractions represent the same quantity. ➢ Determine if two fractions are equivalent using concrete materials or pictorial representations. ➢ Formulate and verify a rule for developing a set of equivalent fractions. ➢ Identify equivalent fractions for a fraction. ➢ Compare two fractions with unlike denominators by creating equivalent fractions. ➢ Position a set of fractions with like and unlike denominators on a number line, and explain strategies used to determine the order.
5.N.8. Describe and represent decimals (tenths, hundredths, thousandths) concretely, pictorially, and symbolically.	➢ Write the decimal for a concrete or pictorial representation of part of a set, part of a region, or part of a unit of measure. ➢ Represent a decimal using concrete materials or a pictorial representation. ➢ Represent an equivalent tenth, hundredth, or thousandth for a decimal, using a grid. ➢ Express a given tenth as an equivalent hundredth and thousandth. ➢ Express a hundredth as an equivalent thousandth. ➢ Describe the value of each digit in a decimal.
5.N.9. Relate decimals to fractions (to thousandths).	➢ Write a decimal in fractional form. ➢ Write a fraction with a denominator of 10, 100, or 1000 as a decimal. ➢ Express a pictorial or concrete representation as a fraction or decimal (e.g., 250 shaded squares on a thousandth grid can be expressed as 0.250 or $\frac{25}{1000}$).

5.N.10. Compare and order decimals (to thousandths) by using • benchmarks • place value • equivalent decimals	➢ Order a set of decimals by placing them on a number line that contains benchmarks, 0.0, 0.5, 1.0. ➢ Order a set of decimals including only tenths using place value. ➢ Order a set of decimals including only hundredths using place value. ➢ Order a set of decimals including only thousandths using place value. ➢ Explain what is the same and what is different about 0.2, 0.20, and 0.200. ➢ Order a set of decimals including tenths, hundredths, and thousandths using equivalent decimals.
5.N.11. Demonstrate an understanding of addition and subtraction of decimals (limited to thousandths).	➢ Place the decimal point in a sum or difference using front-end estimation (e.g., for 6.3 + 0.25 + 306.158, think 6 + 306, so the sum is greater than 312). ➢ Correct errors of decimal point placements in sums and differences without using paper and pencil. ➢ Explain why keeping track of place value positions is important when adding and subtracting decimals. ➢ Predict sums and differences of decimals using estimation strategies. ➢ Solve a problem that involves addition and subtraction of decimals, limited to thousandths.

Grade 5 Patterns & Relations Strand

Outcome	Achievement Indicator
5.PR.1. Determine the pattern rule to make predictions about subsequent elements	➢ Extend a pattern with and without concrete materials, and explain how each element differs from the proceeding one. ➢ Describe, orally or in writing, a pattern using mathematical language, such as one more, one less, five more. ➢ Write a mathematical expression to represent a pattern, such as $r + 1$, $r - 1$, $r + 5$ ➢ Describe the relationship in a table or chart using a mathematical expression. ➢ Determine and explain why a number is or is not the next element in a pattern. ➢ Predict subsequent elements in a pattern. ➢ Solve a problem by using a pattern rule to determine subsequent elements. ➢ Represent a pattern visually to verify predictions.
5.PR.2. Solve problems involving single-variable (expresses as symbols or letters), one-step equations with whole-number coefficients and whole-number solutions.	➢ Express a problem in context as an equation where the unknown is represented by a letter variable. ➢ Solve a single-variable equation with the unknown in any of the terms (e.g., $n + 2 = 5$, $4 + a = 7$, $6 = r - 2$, $10 = 2c$). ➢ Create a problem in context for an equation.

Grade 5 Shape and Space strand

Outcome	Achievement Indicators
5.SS.1. Design and construct different rectangles given either perimeter or area, or both (whole numbers), and draw conclusions.	➢ Construct or draw two or more rectangles for a given perimeter in a problem-solving context. ➢ Construct or draw two or more rectangles for a given area in a problem-solving context. ➢ Illustrate that for any perimeter, the square or shape closest to a square will result in the greatest area. ➢ Illustrate that for any perimeter, the rectangle with the smallest possible width will result in the least area. ➢ Provide a real-life context for when it is important to consider the relationship between area and perimeter.
5.SS.2. Demonstrate an understanding of measuring length (mm) by • selecting and justifying referents for the unit mm • modelling and describing the relationship between mm and cm units, and between mm and m units	➢ Provide a referent for one millimetre and explain the choice. ➢ Provide a referent for one centimetre and explain the choice. ➢ Provide a referent for one metre and explain the choice. ➢ Show that 10 millimetres is equivalent to 1 centimetre using concrete materials (e.g., ruler). ➢ Show that 1000 millimetres is equivalent to 1 metre using concrete materials (e.g., metre stick). ➢ Provide examples of when millimetres are used as the unit of measure.
5.SS.3. Demonstrate an understanding of volume by • selecting and justifying referents for cm^3 or m^3 units • estimating volume by using referents for cm^3 or m^3 • measuring and recording volume (cm^3 or m^3) • constructing rectangular prisms for a given volume	➢ Identify the cube as the most efficient unit for measuring volume and explain why. ➢ Provide a referent for a cubic centimetre and explain the choice. ➢ Provide a referent for a cubic metre and explain the choice. ➢ Determine which standard cubic unit is represented by a given referent. ➢ Estimate the volume of a 3-D object using personal referents. ➢ Determine the volume of a 3-D object using manipulatives and explain the strategy. ➢ Construct a rectangular prism for a given volume. ➢ Explain that many rectangular prisms are possible for a given volume by constructing more than one rectangular prism for the same volume.

5.SS.4. Demonstrate an understanding of capacity by • describing the relationship between mL and L • selecting and justifying referents for mL or L units • estimating capacity by using referents for mL or L • measuring and recording capacity (mL or L)	➢ Demonstrate that 1000 millilitres is equivalent to 1 litre by filling a 1-litre container using a combination of smaller containers. ➢ Provide a referent for a litre and explain the choice. ➢ Provide a referent for a millilitre and explain the choice. ➢ Determine which capacity unit is represented by a given referent. ➢ Estimate the capacity of a given container using personal referents. ➢ Determine the capacity of a container using materials that take the shape of the inside of the container (e.g., a liquid, rice, sand, beads, and explain the strategy).
5.SS.5. Describe and provide examples of edges and faces of 3-D objects, and sides of 2-D shapes that are • parallel • intersecting • perpendicular • vertical • horizontal	➢ Identify parallel, intersecting, perpendicular, vertical, and horizontal edges and faces on 3-D objects. ➢ Identify parallel, intersecting, perpendicular, vertical, and horizontal sides on 2-D shapes. ➢ Provide examples from the environment that show parallel, intersecting, perpendicular, vertical, and horizontal line segments. ➢ Find examples of edges, faces, and sides that are parallel, intersecting, perpendicular, vertical, and horizontal in print and electronic media, such as newspapers, magazines, and the Internet. ➢ Draw 2-D shapes or 3-D objects that have edges, faces, and sides that are parallel, intersecting, perpendicular, vertical, or horizontal. ➢ Describe the faces and edges of a 3-D object using terms such as parallel, intersecting, perpendicular, vertical, or horizontal. ➢ Describe the sides of a 2-D shape using terms such as parallel, intersecting, perpendicular, vertical, or horizontal.
5.SS.6. Identify and sort quadrilaterals, including • rectangles • squares • trapezoids • parallelograms • rhombuses according to their attributes.	➢ Identify and describe the characteristics of a pre-sorted set of quadrilaterals. ➢ Sort a set of quadrilaterals and explain the sorting rule. ➢ Sort a set of quadrilaterals according to the lengths of the sides. ➢ Sort a set of quadrilaterals according to whether or not opposite sides are parallel.

5.SS.7. Perform a single transformation (translation, rotation, or reflection) of a 2-D shape and draw and describe the image.	➢ Translate a 2-D shape horizontally, vertically, or diagonally, and describe the position and orientation of the image. ➢ Rotate a 2-D shape about a point, and describe the position and orientation of the image. ➢ Reflect a 2-D shape in a line of reflection, and describe the position and orientation of the image. ➢ Perform a transformation of a 2-D shape by following instructions. ➢ Draw a 2-D shape, translate the shape, and record the translation by describing the direction and magnitude of the movement. ➢ Draw a 2-D shape, rotate the shape, and describe the direction of the turn (clockwise or counter-clockwise), the fraction of the turn, and point of rotation. ➢ Draw a 2-D shape, reflect the shape, and identify the line of reflection and the distance of the image from the line of reflection. ➢ Predict the result of a single transformation of a 2-D shape and verify the prediction.
5.SS.8. Identify a single transformation (translation, rotation, or reflection) of 2-D shapes.	➢ Provide an example of a translation, a rotation, and a reflection. ➢ Identify a single transformation as a translation, rotation, or reflection. ➢ Describe a rotation by the direction of the turn (clockwise or counter-clockwise).

Grade 5 Statistics and Probability strand

Outcome	Achievement Indicators
5.SP.1. Differentiate between first-hand and second-hand data.	➢ Explain the difference between first-hand and second-hand data. ➢ Formulate a question that can best be answered using first-hand data and explain why. ➢ Formulate a question that can best be answered using second-hand data and explain why. ➢ Find examples of second-hand data in print and electronic media, such as newspapers, magazines, and the Internet.
5.SP.2. Construct and interpret double bar graphs to draw conclusions.	➢ Determine the attributes (title, axes, intervals, and legend) of double bar graphs by comparing a set of double bar graphs. ➢ Represent a set of data by creating a double bar graph, label the title and axes, and create a legend without the use of technology. ➢ Draw conclusions from a double bar graph to answer questions. ➢ Provide examples of double bar graphs used in a variety of print and electronic media, such as newspapers, magazines, and the Internet. ➢ Solve a problem by constructing and interpreting a double bar graph.
5.SP.3. Describe the likelihood of a single outcome occurring using words, such as • impossible • possible • certain	➢ Provide examples of events that are impossible, possible, or certain from personal contexts. ➢ Classify the likelihood of a single outcome occurring in a probability experiment as impossible, possible, or certain. ➢ Design and conduct a probability experiment in which the likelihood of a single outcome occurring is impossible, possible, or certain. ➢ Conduct a probability experiment a number of times, record the outcomes and explain the results.
5.SP.4. Compare the likelihood of two possible outcomes occurring using words, such as • less likely • equally likely • more likely	➢ Identify outcomes from a probability experiment which are less likely, equally likely, or more likely to occur than other outcomes. ➢ Design and conduct a probability experiment in which one outcome is less likely to occur than the other outcome. ➢ Design and conduct a probability experiment in which one outcome is equally as likely to occur as the other outcome. ➢ Design and conduct a probability experiment in which one outcome is more likely to occur than the other outcome.