



Long Range Plan

SUBJECT: Mathematics

GRADE: 4

TEACHER: K. Walkowiak

OVERALL EXPECTATIONS:

Addition: 2 four-digit numbers

Subtraction: a four-digit number subtract a three-digit number

Multiplication: a three-digit number by a one-digit number

Division: a three-digit number by a one-digit number

SPECIFIC EXPECTATIONS:

Term 1

Number Sense and Numeration

Understanding Number:

- recognize and read numbers from 0.01 to 10 000;
- read and write whole numbers to 10 000 in standard, expanded, and written forms (e.g., $9367 = 9000 + 300 + 60 + 7 =$ nine thousand three hundred sixty -seven);
- count by 3's, 4's, 6's, 7's, 8's, 9's, and 10's to 100;
- represent the place value of whole numbers and decimals from 0.01 to 10 000 using concrete materials, drawings, and symbols;
- compare and order whole numbers and decimals from 0.01 to 10 000 using concrete materials, drawings, and symbols;
- represent and explain number concepts and procedures;
- identify the use of number in various careers;
- identify and appreciate the use of numbers in the media.

Computations:

- recall multiplication and division facts to 81;
- add and subtract numbers mentally (e.g., $54 + 79 = [54 + 70] + 9$);

Applications:

- select the appropriate operation and solve one-step problems involving whole numbers;

Measurement

Units of Measure:

- describe the relationship between millimetres, centimetres, decimetres, metres & kilometers;
- draw items given specific lengths;
- select the most appropriate standard unit (mm, cm, dm, metre or km) to measure linear dimensions and the perimeter of regular polygons;
- estimate lengths in millimetres, centimetres, metres & kilometers;
- distinguish between estimated and precise measurements and know when each kind is required;

Patterning and Algebra

- recognize mathematical relationships in patterns (e.g., the second term is two more than the first, the second shape is the first shape turned through 90 degrees);
- demonstrate equivalence in simple numerical equations using concrete materials, drawings, and symbols (e.g., $13 + 7 = 19 + 1$);
- identify, extend, and create patterns by changing two or more attributes (e.g., colour, size, orientation);
- describe patterns encountered in any context (e.g., quilt patterns, money), make models of the patterns, and create charts to display the patterns;

Term 2

Number Sense and Numeration

Understanding Number:

- count by 3's, 4's, 6's, 7's, 8's, 9's, and 10's to 100;
- identify the use of number in various careers;
- identify and appreciate the use of numbers in the media;
- represent, compare, and order mixed numbers and proper and improper fractions with like denominators (e.g., $1/5$ and $3/5$ or $1/8$ and $4/8$) using concrete materials and drawings;
- connect proper fractions with decimals (tenths and hundredths) using concrete materials, drawings, and symbols;
- explore the relationships between fractions and decimals using a calculator, concrete materials, and drawings (e.g., $1/4$ on a calculator is entered as $1 \div 4$);
- read and write decimal numbers to hundredths;
- compare and order decimals;

COMPUTATIONS:

- recall multiplication and division facts to 81;
- add and subtract numbers mentally (e.g., $54 + 79 = [54 + 70] + 9$);

- add and subtract decimal numbers to tenths using concrete materials, drawings, and symbols;
- demonstrate an understanding of the addition and subtraction of decimal numbers to hundredths;

APPLICATIONS:

- select the appropriate operation and solve one -step problems involving whole numbers and decimals with and without a calculator (e.g. , how much change will you receive when you purchase an \$8.95 item with \$10?);
- pose problems involving whole numbers and solve them using the appropriate calculation method: pencil and paper, or calculator or computer (e.g., what 2 items whose total cost is less than \$20 can I buy from this catalogue?);
- explain their thinking when solving problems involving whole numbers;

Geometry and Spatial Sense

THREE- AND TWO-DIMENSIONAL GEOMETRY:

- identify the two-dimensional shapes of the faces of three -dimensional figures;
- sketch the faces that make up a three -dimensional figure using concrete materials as models;
- design and make skeletons (e.g., with straws or toothpicks and marshmallows) for three-dimensional figures;
- identify and sort quadrilaterals (e.g., square , trapezoid);
- sort and classify two-dimensional figures according to shape;
- identify similar and congruent figures using a variety of media;
- construct congruent figures in a variety of ways (e.g., cutting and matching, using a geoboard);
- discover geometric patterns and solve geometric puzzles with and without the use of computer applications;
- recognize and describe the occurrence and application of geometric properties and principles in the everyday world;
- discuss geometric concepts with peers and explain t heir understanding of the concepts;
- discuss ideas, make connections, and articulate hypotheses about geometric properties and relationships;

TRANSFORMATIONAL GEOMETRY:

- draw lines of symmetry on two -dimensional shapes;

Data Management and Probability

Collecting and Organizing Data:

- identify examples of the use of data in the world around them;
- before gathering data, predict the possible results of a survey based on their experiences;
- conduct surveys and record data on tally charts;
- display data by hand and by using computer applications on horizontal and vertical bar graphs and on pictographs using many -to-one correspondence (e.g., if a picture of 1 car represents 4 cars, then a picture of 1.5 cars represents 6 actual cars);

Analysing Data:

- explain how data were collected and describe the results of a survey;
- use conventional symbols, titles, and labels when displaying data;
- find the range of data values;

Concluding and Reporting:

- recognize the purposes of different parts of a graph: title, labels, axes;
- construct labelled graphs (e.g., labelled with titles, horizontal and vertical axes, intervals, and data points) both by hand and by using computer applications, and create intervals suited to the range and distribution of the data gathered (e.g., a graph with a range of 100 years is better divided into intervals of 10 years than 1 year);
- read and interpret data presented on tables, charts, and graphs (e.g., circle graphs) and discuss the important features;

Term 3

Number Sense and Numeration

Understanding Number:

- identify real-world applications of integers(e.g. reading below -zero temperatures)

Computations:

- justify the choice of method for calculations: estimation, mental computation, concrete materials, algorithms or calculators
- select operations and solve multi-step problems involving whole numbers and decimals with and without a calculator
- add and subtract decimal numbers to thousandths using concrete materials, drawings and symbols
- multiply and divide decimal numbers to thousandths by a one -digit whole number
- use the correct order of operations when solving number sentences involving whole numbers (e.g. $13 + 40 \times 2 = 13 + 80 = 93$)

Measurement

Capacity, Volume and Mass:

- estimate and calculate the volume of rectangular prisms
- develop rules for calculating the volume of rectangular prisms, generalize rules and develop formulas (e.g. Volume = surface area of the base x height)
- determine the relationship between milligrams, grams and kilograms

Geometry and Spatial Sense

Three-and Two-Dimensional Geometry:

- estimate the size of angles within a reasonable range
- construct a variety of two-dimensional shapes given specific measures of angles and sides, using a variety of tools
- use a computer application to explore and extend geometric concepts
- use mathematical language to describe geometric ideas (e.g. obtuse -angled triangle, triangular prism)
- recognize and describe in mathematical language the occurrence and application of geometric properties and principles in the everyday world
- discuss geometric concepts with peer and use mathematical language to explain their understanding
- explain, make conjectures about, and articulate hypotheses about geometric properties and relationships

Transformational Geometry:

- visualize and describe the effect of translations, reflections and rotations
- apply and analyze translations, reflections, and rotations in a variety of geometric contexts
- construct tiling patterns to cover a plane

Coordinate Geometry:

- demonstrate an understanding of coordinates in a Cartesian plane in the first quadrant and plot points

Patterning and Algebra

- identify and extend patterns to solve problems in meaningful contexts (e.g. notes in music, patterns on graphs)
- use a calculator and computer applications to explore patterns

Data Management and Probability

Analyzing Data:

- explain how the choice of intervals affects the appearance of data
- calculate the median of a set of data

Probability:

- connect the possible events and the probability of a particular event (e.g. in flipping a coin, rolling a die)
- examine experimental probability results in the light of theoretical results
- use tree diagrams to record the results of systematic counting
- show an understanding of probability in making relevant decisions