Organizing Idea

Book Chapters of the Subject Area

Alberta Regional Professional Development Consortia
Adult learning for students' sake

Learning Outcome

What students are required to know, understand, and able to do BY THE END OF THE GRADE. **Must be assessed and reported**

Understanding

Gives significance to knowledge statements

Skills and Procedures

What students need to be able to do to show understanding of learning outcome.

PRINTING TIP

Download slides as a PDF. Print your PDF with '4 pages per sheet' and you will get **'cue card' sized** slides that you can manipulate and use for your planning.

Want the speaker notes (i.e. GQ and knowledge) too?

In the 'Print Settings and Preview' select "Slide with Notes' and save download as a PDF. Print your PDF with 2 pages per sheet and you can fold the bottom half back so the slide is visible from the front and the notes on the back.

Organizing Idea

Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.

Learning Outcome

Students analyze patterns in place value.

Understanding

Place value symmetry extends infinitely to the left and right of the ones place.

Skills and Procedures

Relate the names of place values that are the same number of places to the left and right of the ones place.

Express numbers within 10 000 000, including decimal numbers to thousandths, using words and numerals.

Relate a decimal number to its position on the number line.

Determine a decimal number between any two other decimal numbers.

Compare and order numbers, including decimal numbers.

Express the relationship between two numbers, including decimal numbers, using > , <, or = .

Round numbers, including decimal numbers, to various places according to context.

Organizing Idea

Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.

Learning Outcome

Students add and subtract within 1 000 000, including decimal numbers to thousandths, using standard algorithms.

Understanding

Addition and subtraction of numbers with many digits is facilitated by standard algorithms.

Skills and Procedures

Add and subtract numbers, including decimal numbers, using standard algorithms.

Assess the reasonableness of a sum or difference using estimation.

Solve problems using addition and subtraction, including problems involving money.

Organizing Idea

Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.

Learning Outcome

Students determine divisibility of natural numbers.

Understanding

A number is divisible by another number if it can be divided with a remainder of 0.

Skills and Procedures

Investigate divisibility by natural numbers to 10, including 0.

Generalize divisibility tests for 2, 3, and 5.

Determine factors of natural numbers using divisibility tests

Organizing Idea

Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.

Learning Outcome

Students multiply and divide natural numbers within 100 000, including with standard algorithms.

Understanding

Standard algorithms are efficient procedures for multiplication and division.

Skills and Procedures

Explain the standard algorithms for multiplication and division of natural numbers.

Multiply up to 3-digit by 2-digit natural numbers using standard algorithms.

Divide 3-digit by 1-digit natural numbers using standard algorithms.

Express a quotient with or without a remainder according to context.

Assess the reasonableness of a product or quotient using estimation.

Solve problems using multiplication and division of natural numbers.

Organizing Idea

Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.

Learning Outcome

Students interpret improper fractions.

Understanding

Fractions allow counting and measuring between whole quantities.
Improper fractions and mixed numbers that represent the same number are associated with the same point on the number line.

Skills and Procedures

Relate fractions, improper fractions, and mixed numbers to their positions on the number line.

Count beyond 1 using fractions with the same denominator.

Model fractions, including improper fractions and mixed numbers, using quantities, lengths, and areas.

Express improper fractions and mixed numbers symbolically.

Express an improper fraction as a mixed number and vice versa.

Compare fractions, including improper fractions and mixed numbers, to benchmarks of 0, ½ , and 1.

Organizing Idea

Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.

Learning Outcome

Students add and subtract fractions with common denominators.

Understanding

Fractions with common denominators are multiples of the same unit fraction.
Properties for addition and subtraction of natural numbers apply to fractions

Skills and Procedures

Investigate the composition and decomposition of a quantity within 1 using unit fractions.

Express the composition or decomposition of fractions with common denominators as a sum or difference.

Compare strategies for adding or subtracting improper fractions to strategies for adding or subtracting mixed numbers.

Add and subtract fractions with common denominators within 100, including improper fractions and mixed numbers.

Solve problems requiring addition and subtraction of fractions with common denominators, including improper fractions and mixed numbers.

Organizing Idea

Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.

Learning Outcome

Students employ ratios to represent relationships between quantities.

Understanding

A ratio is a comparison of two quantities in a specific situation.

Fractions, decimals, ratios, and percentages can represent the same part-whole relationship.

Skills and Procedures

Express part-part ratios and part-whole ratios of the same whole to describe various situations.

Express, symbolically, the same part-whole relationship as a ratio, fraction, decimal, and percentage.

Organizing Idea

Algebra: Equations express relationships between quantities.

Learning Outcome

Students interpret numerical and algebraic expressions.

Understanding

Numerical expressions represent a quantity of known value.
Parentheses change the order of operations in a numerical expression.
Algebraic expressions use variables to represent quantities of unknown value.
Algebraic expressions may be composed of one algebraic term or the sum of algebraic and constant terms.

Skills and Procedures

Evaluate numerical expressions involving addition or subtraction in parentheses according to the order of operations.

Relate repeated addition of a variable to the product of a number and a variable.

Express the product of a number and a variable using a coefficient.

Express the quotient of a variable and a number as a fraction.

Express the quotient of a variable and a number as a fraction.

Recognize a product with a variable, a quotient with a variable, or a number as a single term.

Write an algebraic expression involving one or two terms to describe an unknown value.

Evaluate an algebraic expression by substituting a given number for the variable.

Organizing Idea

Algebra: Equations express relationships between quantities.

Learning Outcome

Students interpret numerical and algebraic expressions.

Understanding

Equality is preserved by applying inverse operations to algebraic expressions on each side of an equation.
The expressions on each side of an equation will be equal when evaluated using the correct solution.

Skills and Procedures

Write equations involving one or two operations to represent a situation.

Investigate order of operations when performing inverse operations on both sides of an equation.

Apply inverse operations to solve an equation, limited to equations with one or two operations.

Verify the solution to an equation by evaluating expressions on each side of the equation.

Solve problems using equations, limited to equations with one or two operations.

Organizing Idea

Geometry: Shapes are defined and related by geometric attributes.

Learning Outcome

Students investigate symmetry as a geometric property.

Understanding

Symmetry is a property of shapes.
Symmetry can be created and can occur in nature.
Symmetry is related to other geometric properties.

Skills and Procedures

Recognize symmetry in nature.

Recognize symmetry in First Nations, Métis, and Inuit designs.

Investigate symmetry in familiar 2-D and 3-D shapes using hands-on materials or digital applications. Show the line of symmetry of a 2-D shape. Describe the order of rotation symmetry of a 2-D shape.

Compare the number of reflection and rotation symmetries of a 2-D shape to the number of equal sides and angles.

Classify 2-D shapes according to the number of reflection or rotation symmetries.

Organizing Idea

Coordinate Geometry: Location and movement of objects in space can be communicated using a coordinate grid.

Learning Outcome

Students relate location to position on a grid.

Understanding

Location can describe the position of shapes in space.
Location can be described precisely using a coordinate grid.

Skills and Procedures

Locate a point on a coordinate grid given the coordinates of the point.

Describe the location of a point on a coordinate grid using coordinates.

Describe the location of a point on a coordinate grid in relation to the location of another point using positional language.

Model a polygon on a coordinate grid using coordinates to indicate the vertices.

Describe the location of the vertices of a polygon on a coordinate grid using coordinates.

Organizing Idea

Measurement: Attributes such as length, area, volume, and angle are quantified by measurement.

Learning Outcome

Students estimate and calculate area using standard units.

Understanding

Area can be expressed in various units according to context and desired precision.
Rectangles with the same area can have different perimeters.

Skills and Procedures

Relate a centimetre to a square centimetre.

Relate a metre to a square metre.

Relate a square centimetre to a square metre. Express the relationship between square centimetres, square metres, and square kilometres. Justify the choice of square centimetres, square metres, or square kilometres as appropriate units to express various areas.

Estimate an area by comparing to a benchmark of a square centimetre or square metre.

Express the area of a rectangle using standard units given the lengths of its sides.

Compare the perimeters of various rectangles with the same area.

Describe the rectangle with the least perimeter for a given area.

Solve problems involving perimeter and area of rectangles.

Organizing Idea

Patterns: Awareness of patterns supports problem solving in various situations.

Learning Outcome

Students relate terms to position within an arithmetic sequence.

Understanding

Each term of an arithmetic sequence corresponds to a natural number indicating position in the sequence.

Skills and Procedures

Represent one-to-one correspondence between positions and terms of an arithmetic sequence in a table of values and on a coordinate grid.

Describe the graph of an arithmetic sequence as a straight line. Describe a rule, limited to one operation, that expresses correspondence between positions and terms of an arithmetic sequence.

Write an algebraic expression, limited to one operation, that represents correspondence between positions and terms of an arithmetic sequence.

Determine the missing term in an arithmetic sequence that corresponds to a given position.

Solve problems involving an arithmetic sequence

Organizing Idea

Statistics: The science of collecting, analyzing, visualizing, and interpreting data can inform understanding and decision making.

Learning Outcome

Students analyze frequency in categorical data.

Understanding

Frequency is a count of categorized data, but it is not the data value itself

Skills and Procedures

Examine categorized data in tables and graphs.

Determine frequency for each category of a set of data by counting individual data points.

Identify the mode in various representations of data.

Recognize data sets with no mode, one mode, or multiple modes.

Justify possible answers to a statistical question using mode.

Organizing Idea

Statistics: The science of collecting, analyzing, visualizing, and interpreting data can inform understanding and decision making.

Learning Outcome

Students analyze frequency in categorical data.

Understanding

Frequency can be a count of categorized responses to a question.
Frequency can be used to summarize data. Frequency can be represented in various forms.

Skills and Procedures

Discuss potential categories for open-ended questions and closed-list questions in relation to the same statistical question.

Formulate closed-list questions to collect data to answer a statistical question.

Categorize data that was collected using closed-list questions.

Organize counts of categorized data in a frequency table.

Create various representations of data, including with technology, to interpret frequency.