Mathematics Essentials 10

General Curriculum Outcomes

A. Students will demonstrate number sense and apply number-theory concepts.
B. Students will demonstrate operation sense and apply operation principles and procedures in both numeric and algebraic situations.
C. Students will explore, recognize, represent, and apply patterns and relationships, both informally and formally.
D. Students will demonstrate an understanding of, and apply concepts and skills associated with, measurement.
E. Students will demonstrate spatial sense and apply geometric concepts, properties, and relationships.
F. Students will solve problems involving the collection, display, and analysis of data.
G. Students will represent and solve problems involving uncertainty.

Specific Curriculum Outcomes

By the end of Mathematics Essentials 10, students will be expected to

The Mental Math

B16 know the double facts in additions; their extension to two, three, and four digits; their connections to subtraction, multiplication by 2 and by ½ , division by 2 and multiplication by 50 percent
B17 know the addition and subtraction facts and extend them to two, three, and four digit numbers
B18 estimate appropriate sums, differences, products, and quotients
B19 mentally calculate 1%, 10%, 15%, and 50% quantities that are compatible with these percentage
B20 estimate and calculate percentage of quantities as performing operations with decimals, fractions, and percent

Earning and Purchasing

A1 understand purchasing power
A2 explain the difference between gross pay and net pay, and describe possible payroll deductions
A3 explain indirect and direct forms of taxation
A4 identify and explain the advantages and disadvantages of various plans to make purchases

B1 determine the remuneration for chosen occupations, including salary and benefits, and evaluate it in terms of purchasing power and living standards
B2 solve problems involving various ways that an employee can be paid using calculators or appropriate software
B3 calculate gross pay and net pay for given situations
B4 estimate and calculate the unit prices of comparable items to determine the best buy
B5 solve problems involving the estimation and calculation of provincial and federal sales taxes
B6 estimate and calculate selling price, discounts, and taxes
B7 provide the correct change for an amount offered and minimize the number of coins/bills

B8   select amounts to offer for a given charge to minimize the number of coins/bills received in the change
B9   identify, calculate, and compare the interest costs involved in making purchases under various plans
B10 estimate and calculate the price in Canadian funds of items bought in or ordered from another country

F1   read and apply payroll deduction tables
F2   (optional) identify the information and documents required for filing a personal income tax return, and explain why they are required
F3   describe the effects on personal spending habits of the frequency of pay period
F4   make decisions regarding the purchase of costly items by identifying and ranking criteria for the comparison of possible choices
F5   make decisions regarding the payment options for purchases
F6   identify various incentives to make purchases

Banking

A5   understand transactions such as depositing, transferring and withdrawing money, writing cheques and withdrawing money
A6   understand what interest is and how interest is calculated by a bank

B11 calculate simple and compound interest

C1   recognize patterns in tables where simple and compound interest has been calculated

Measurement

A7   recognize and find equivalencies among common fractions and percent
A8   compare and order common fractions and percent ages
A9   rename common fractions
A10 round rational numbers and percentages in contexts

C2   recognize and apply the patterns in the metric system
C3   recognize and apply the common fraction patterns found on an Imperial ruler

D1   demonstrate a working knowledge of the metric system and imperial system
D2   measure lengths accurately, using metric system and the imperial system
D3   estimate distances in metric units and in imperial units by applying personal referents
D4   estimate capacities in metric units by applying personal referents
D5   estimate, with reasonable accuracy, large numbers that are illustrated visually and explain the strategies used

Geometry

E1   identify the first five regular polygons and understand basic properties (number of sides, lines of symmetry, and definitions of geometric terms)

E2   describe and apply translations, reflections, rotations, and dilatations as they relate to symmetry and design, with the aid of technology

E3   determine (through investigations, using concrete materials and technology) the characteristics of shapes that will tile the plane with a reflecting pattern

E4   create designs involving tiling patterns (e.g., Escher-type designs, wallpaper or fabric designs), using technology (e.g., dynamic geometry software, design or drawing software

E5   analyze the geometric aspects of logos and design

E6   create a personal logo, using the mathematics of symmetry, translations, reflections, rotations, or dilatations, with the aid of technology

Travel and Transportation

A11   describe the procedures and costs involved in obtaining a driver's license

A12   describe the costs if failing to operate a vehicle responsibly

A13   compare the procedures, costs, advantages, and disadvantages involved in buying a new versus a used vehicle

A14   explain the factors and costs involved in insuring a vehicle

B12   calculate the fixed and variable costs involved in owning and operating a vehicle

B13   compare the costs involved in buying versus leasing the same new vehicle

B14   compare the costs of owning or leasing and maintaining vehicle with the costs of other forms of transportation

B15   complete a project involving the purchase or lease of a new vehicle or the purchase of a used vehicle, including the cost of insurance

F7   make personal decisions regarding the best form of transportation

Probability

G1   express probabilities of simple events as the number of favourable outcomes divided by the total number of outcomes

G2   express probabilities as fractions, decimals, and percentages and interpret probabilities expressed in each of these forms

G3   predict and describe the results obtained in carrying out probability experiments related to familiar situations involving chance

G4   compare predicted and experimental results for familiar situations involving chance, using technology to extend the number of experimental trials

G5   simulate familiar situations involving chance and explain the choice of simulation

G6   interpret information about probabilities to assist in making informed decisions in a variety of situations

G7   interpret and assess probabilistic information used in the media and in common conversation