

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 $\frac{1}{2}$, 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