Complete
Canadian
Curriculum

Grade
6

Math

Popular Canada

Number Sense and Numeration

- **6-digit Numbers**

e.g.

Thousands					
Hundred	Ten	One	Hundreds	Tens	Ones
5	3	2	6	4	8

5 is in the hundred thousands place; it means 500 000.

Standard Form: 532 648 ← Starting from the right, add a space for every three digits.

Expanded Form: 500 000 + 30 000 + 2000 + 600 + 40 + 8

Written Form: five hundred thirty-two thousand six hundred forty-eight

- **Multiples and Factors**

Multiple – the product of a given whole number multiplied by any other whole number

Use addition or multiplication to find the multiples of a given number.

e.g. The multiples of 4

- by addition

$4 \xrightarrow{+4} 8 \xrightarrow{+4} 12 \xrightarrow{+4} 16$

- by multiplication

$\frac{4}{4 \times 1}$ $\frac{8}{4 \times 2}$ $\frac{12}{4 \times 3}$ $\frac{16}{4 \times 4}$

The first four multiples of 4: 4, 8, 12, 16

Factors – whole numbers that are multiplied to get a product

e.g. Find the factors of 15.

"1" is a factor of all numbers.

$15 = \underline{\mathbf{1}} \times \underline{\mathbf{15}}$

$15 = \underline{\mathbf{3}} \times \underline{\mathbf{5}}$

So, the factors of 15 are 1, 3, 5, and 15 .

• Prime Numbers and Composite Numbers

Prime Number – any number with only 1 and itself as factors; e.g. 7

Composite Number – any number greater than 1 that has more than 2 factors; e.g. 9

* **1** is neither a composite nor a prime number.
* **2** is the smallest prime number.

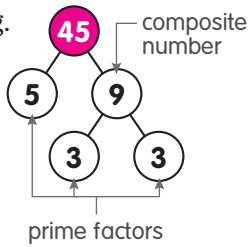
Steps to writing numbers as a product of prime factors:

1st Write the composite number as the product of two factors.

2nd Continue to factorize each composite number until all factors are prime numbers.

3rd Write the number as a product of prime factors.

e.g.



$45 = \underline{\mathbf{3 \times 3 \times 5}}$

• Order of Operations

Perform the operations (+/–) from left to right.

Without Brackets

$357 - 128 + 69$ ← Do "–" first.
$= 229 + 69$
$= \underline{298}$

With Brackets

$357 - (128 + 69)$ ← Do the part inside the brackets first.
$= 357 - 197$
$= \underline{160}$

• Commutative Property and Distributive Property

Commutative Property

In multiplication, numbers can be multiplied in any order.

e.g. $6 \times 17 \times 5$
$= 6 \times 5 \times 17$ ← Do "6×5" first to make the multiplication easier.
$= 30 \times 17$
$= \underline{510}$

Distributive Property

Use the distributive property to make division easier.

e.g. $(660 - 6) \div 6$
$= 660 \div 6 - 6 \div 6$ ← Remove brackets by dividing each term by 6.
$= 110 - 1$
$= \underline{109}$

- **Fractions**

Steps to comparing mixed numbers with different denominators:

1st Compare the whole number parts. The one with a greater number is greater. If they are the same, go to Step 2.

2nd Compare the fraction parts by using diagrams. The one with a greater coloured part is greater.

e.g. $2\frac{5}{8}$ $2\frac{1}{3}$

the same

1st $2\frac{5}{8}$ $2\frac{1}{3}$

2nd $\frac{5}{8}$  $\frac{1}{3}$ 

So, $2\frac{5}{8}$ is greater.

When fractions with different denominators have the same numerators, the one with the smallest denominator is the greatest.

e.g. $\frac{2}{5}$ $\frac{2}{11}$ $\frac{2}{6}$ ← same numerators ← 5 is the smallest

So, $\frac{2}{5}$ is the greatest.

- **Decimals**

e.g.

Ones	Tenths	Hundredths	Thousandths
4 .	2	8	5

"5" is in the thousandths place; it means 0.005.

Multiplication/Division of Decimals

A Decimal × A Whole Number

Multiply the same way as whole numbers.

e.g.

$$\begin{array}{r} {\scriptstyle 5} \\ 3.9 \\ \times \quad 6 \\ \hline 23.4 \end{array}$$

1 decimal place

* Remember to place the decimal point in the product.

A Decimal ÷ A Whole Number

Divide the same way as whole numbers.

align

$$\begin{array}{r} 6.9 \\ 4\overline{)27.6} \\ 24 \\ \hline 36 \\ 36 \\ \hline \end{array}$$

Put the decimal point in the quotient directly above the one in the dividend.

A Whole Number × 0.1/0.01/0.001

Move the decimal point 1/2/3 places to the left.

e.g. $34 \times 0.1 =$ **3.4** (1 place to the left)

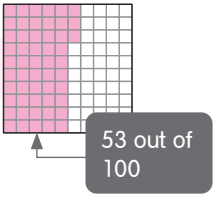
$34 \times 0.01 =$ **0.34** (2 places to the left)

$34 \times 0.001 =$ **0.034** (3 places to the left)

- **Fractions, Decimals, and Percents**

Percent means "per hundred".

Fifty-three percent (53%) is coloured.



A percent can also be expressed as a fraction or a decimal. So, $53\% = \frac{53}{100} = 0.53$.

- **Unit Rates and Ratios**

Rate – a comparison of two quantities with different units; for example, number of apples and cost (6 apples for $5)

Unit Rate – a comparison of two quantities with different units in which the second quantity is 1; for example, 100 km/h

Ratio – a comparison of quantities with the same unit; can be expressed in ratio form or in fraction form; for example, 3:4 or $\frac{3}{4}$

To find equivalent ratios, multiply or divide each term by the same number other than 0.

e.g. $\frac{6}{10} = \frac{6 \times 3}{10 \times 3} = \frac{18}{30}$; $\frac{6}{10} = \frac{6 \div 2}{10 \div 2} = \frac{3}{5}$

Equivalent Ratios

6 : 10 = 18 : 30

6 : 10 = 3 : 5

Measurement

- **Perimeter and Area**

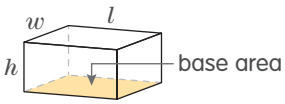
Area of a Parallelogram

= base × height

Area of a Triangle

= base × height ÷ 2

- **Volume and Surface Area**



Volume of a Prism

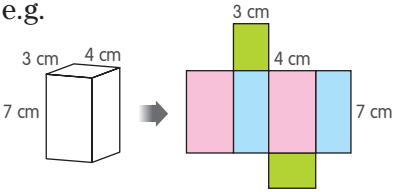
= base area × height

= $l \times w \times h$

Surface Area of a Prism

= the sum of the areas of its faces

e.g.



Volume

= $3 \times 4 \times 7$ = 84 (cm^3)

Surface Area

= $4 \times 7 \times 2 + 3 \times 7 \times 2 + 3 \times 4 \times 2$

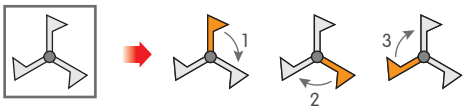
= $56 + 42 + 24$

= 122 (cm^2)

Geometry

- **2-D Shapes**

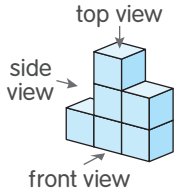
A figure has rotational symmetry if it fits on itself within a complete rotation. The order of rotational symmetry is the number of times the figure fits on itself in one complete rotation.



This shape has rotational symmetry of order **3**.

- **3-D Figures**

Different views of a structure built by cubes:

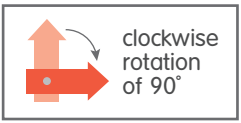


top view

side view

front view

A rotation is a transformation that turns a shape about a fixed point to form a congruent shape.

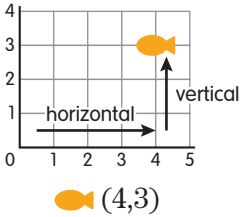


- **Coordinate System**

  To locate a point in a coordinate system, the first coordinate is the horizontal position and the second coordinate is the vertical position.

  (horizontal position,vertical position)

e.g.



Patterning

Solving Equations Using Substitution:

e.g. **Given** $a - 3 = 5$

$a + b - 3 = 11$

$a - 3 + b = 11$ ← Rearrange.

$5 + b = 11$ ← Substitute.

$b = 6$ ← Think: What number plus 5 is 11?

Graphs

Use the appropriate type of graphs to show data:

Circle Graph – for showing data that are parts of a whole

Bar Graph – for making comparisons among data

Double Bar Graph – for comparing two sets of data

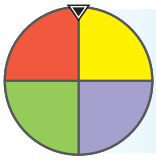
Line Graph – for showing changes over time

Double Line Graph – for comparing two sets of data over time

Probability

Theoretical Probability – a mathematical calculation of the chance that an event will happen in theory

e.g. **Theoretical Probability** $= \dfrac{\textbf{no. of favourable outcomes}}{\textbf{total no. of possible outcomes}}$



The theoretical probability of landing on each section is $\frac{1}{4}$. If the spinner is spun 100 times, it is predicted that it will land on each section 25 times.