

Complete  
**Canadian**   
**Curriculum**

*A handy book to guide you through  
key terms and concepts!*

# Smart Guide Book

Math | English | History  
Geography | Science



Popular Book Company (Canada) Ltd.

Grade

# 7

Complete  
Canadian Curriculum



# Smart Guide Book



Grade

**7**

## Contents

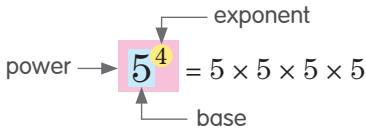
---

Math	2 – 7
English	8 – 11
History	12
Geography	13
Science	14 – 16

# Number Sense and Numeration

- **Power** – a number written in exponential form

e.g.



**5<sup>4</sup>** We say "5 to the power of 4".

- **Squares and Square Roots**

## Square Number

– an integer that is the square of an integer

## Square Root of a Number

– the inverse operation of the square of that number

a square number  
 ↓  
 e.g.  $4 \times 4 = \underline{16}$   
16 is the square number of 4. The square root of 16 is 4.

- **Factors and Multiples**

## Finding the Greatest Common Factor (G.C.F.) of Numbers

- 1st List out the factors of each number.
- 2nd Circle all the common factors. The greatest one is the G.C.F.

e.g. 12 and 18

**factors**

12: ①, ②, ③, 4, ⑥, 12

18: ①, ②, ③, ⑥, 9, 18

The G.C.F. of 12 and 18: 6

## Finding the Least Common Multiple (L.C.M.) of Numbers

- 1st List out some multiples of each number.
- 2nd Circle all the common multiples. The least one is the L.C.M.

e.g. 4 and 6

**multiples**

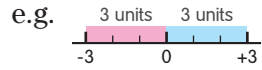
4: 4, 8, ⑫, 16, 20, ⑫, 28...

6: 6, ⑫, 18, ⑫, 30...

The L.C.M. of 4 and 6: 12

- **Integer** – a whole number that can be positive, negative, or zero

Two integers are opposites if they are each the same distance away from zero.

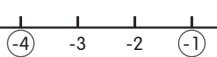


integers: -3, 0, +3

“-3” is the opposite of “+3”.

## Comparing Integers

An integer is always greater than the integer on its left.

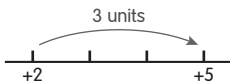
e.g.  “-4” is on the left of “-1”, so  $-1 > -4$ .

## Addition/Subtraction of Integers

### Adding Integers

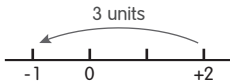
When adding a positive integer, move to the right.

e.g.  $+2 + (+3) = +5$



When adding a negative integer, move to the left.

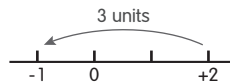
e.g.  $+2 + (-3) = -1$



### Subtracting Integers

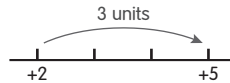
When subtracting a positive integer, move to the left.

e.g.  $+2 - (+3) = -1$



When subtracting a negative integer, move to the right.

e.g.  $+2 - (-3) = +5$



- **Ratios** – dividing both terms in a ratio by their G.C.F. to write the ratio in simplest form

e.g. Write 12:30 in simplest form. ←

**Think**: The G.C.F. of 12 and 30 is 6.

$$12:30 = \frac{12}{6} : \frac{30}{6}$$

The simplest form of 12:30 is 2:5.

• **Fractions**

**Addition/Subtraction of Fractions with Different Denominators**

- 1st Find the L.C.M. and equivalent fractions.
- 2nd Add/Subtract the numerators and keep the denominator the same.
- 3rd Write the answer in simplest form.

e.g.  $\frac{5}{6} + \frac{3}{10}$  ← L.C.M.: 30

$$= \frac{25}{30} + \frac{9}{30}$$
 ← equivalent fractions
 
$$= \frac{34}{30}$$
 ← Add the numerators.
 
$$= 1\frac{4}{30}$$

$$= \underline{1\frac{2}{15}}$$
 ← in simplest form

**Multiplication of a Whole Number and a Fraction**

- 1st Multiply the numerator with the whole number.
- 2nd Write the answer in simplest form.

e.g.  $6 \times \frac{3}{8}$

$$= \frac{18}{8}$$
 ←  $6 \times 3$ 

$$= \underline{2\frac{1}{4}}$$
 ← Write as a mixed number.

• **Decimals**

**Multiplication of Decimals**

Multiply the same way as whole numbers. Put the decimal point in the answer at as many decimal places as the two original decimal numbers combined.

e.g.

$$\begin{array}{r} 1.23 \\ \times 1.7 \\ \hline 861 \\ 1230 \\ \hline 2.091 \end{array}$$

← 2 decimal places

← 1 decimal place

← 3 decimal places

**Division of Decimals**

- 1st Change the divisor into a whole number by moving the decimal point to the right end, and move the decimal point of the dividend the same number of places.
- 2nd Divide as “Decimals ÷ Whole Numbers”.

e.g.  $8.64 \div 2.4$


$$= 86.4 \div 24$$

$$= \underline{3.6}$$

$24 \overline{) 86.4}$	$3.6$
$\underline{72}$	$\underline{72}$
$144$	$\underline{144}$
$\underline{144}$	$\underline{144}$

- **Fractions, Decimals, and Percents**

using fractions, decimals, and percents to describe parts of a whole

e.g.  =  $\frac{3}{4} = \frac{75}{100} = 0.75 = 75\%$

**Finding the Percent of an Amount**

**1st** Write the percent as a decimal.

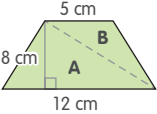
**2nd** Multiply the decimal with the amount.

e.g. 30% of 50  
 =  $\underline{0.3} \times 50$  ← 30% = 0.3  
 =  $\underline{15}$

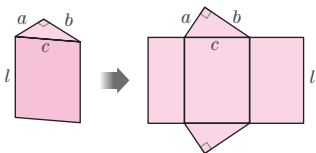
**Measurement**

- **Area of a Trapezoid** = the sum of the areas of 2 triangles (A and B) OR



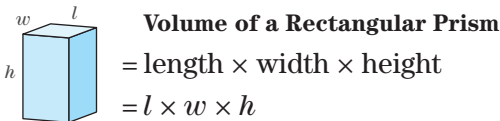
e.g.  Area of A =  $(12 \times 8) \div 2 = 48$   
 Area of B =  $(5 \times 8) \div 2 = 20$   
 Area of trapezoid =  $48 + 20 = \underline{68 \text{ (cm}^2\text{)}}$

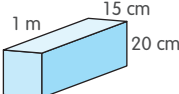
- **Surface Area of a Triangular Prism**



**Surface Area of a Triangular Prism**  
 =  $a \times l + b \times l + c \times l + (a \times b) \div 2 \times 2$   
 =  $\underline{a \times l + b \times l + c \times l + a \times b}$

- **Volume of a Rectangular Prism**

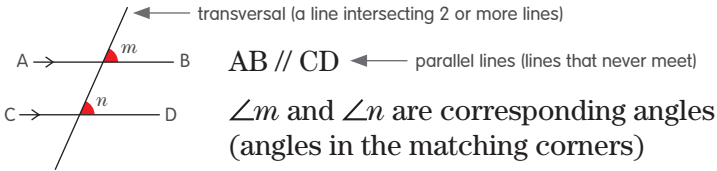


e.g.  Volume =  $15 \times 20 \times 100^*$  ← 1 m = 100 cm  
 =  $\underline{30\,000 \text{ (cm}^3\text{)}}$

\* Make sure that all measures have the same unit.

# Geometry

## • Angles Formed by Intersecting Lines



AB is parallel to CD, so  $\angle m = \angle n$ .

## • Triangles

### Naming Triangles by Angles



**acute triangle**  
all angles are less than  $90^\circ$



**right triangle**  
has an angle of  $90^\circ$



**obtuse triangle**  
has an angle that is between  $90^\circ$  and  $180^\circ$

### Naming Triangles by Sides



**equilateral triangle**  
all sides are equal

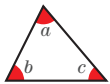


**isosceles triangle**  
two sides are equal



**scalene triangle**  
no sides are equal

## • Angles in a Triangle



The sum of the angles in a triangle is always  $180^\circ$ .

$$a + b + c = 180^\circ$$

## • Rules to Prove Two Triangles are Congruent

### side-side-side



3 pairs of corresponding sides are equal

### side-angle-side



2 pairs of corresponding sides and 1 pair of angles between the sides are equal

### angle-side-angle



2 pairs of corresponding angles and 1 pair of sides between the angles are equal

### angle-angle-side



2 pairs of corresponding angles and 1 pair of corresponding sides are equal

## Coordinates

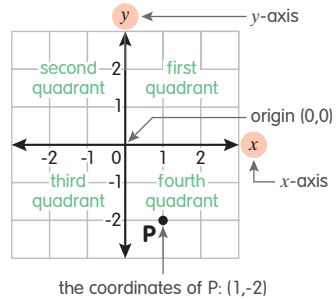
- **The Key Elements of a Coordinate System**

For the points on the  $x$ -axis, their  $y$ -coordinates are 0.

$(x, 0)$

For the points on the  $y$ -axis, their  $x$ -coordinates are 0.

$(0, y)$



## Patterning and Algebra

- **Writing Algebraic Expressions**

e.g.  $y + 1$  (a number **increased** by 1)

$5 \times m$  (5 **times** a number)

$10 - a$  (a number **subtracted from** 10)

$\frac{b}{2}$  (a number **divided** by 2)

$n - 4$  (4 **less than** a number)

$6 - b$  (6 **minus** a number)

- **Solving Equations**

e.g.  $3y - 2 = 16$

$3y - 2 + 2 = 16 + 2$  ← Undo the “-”.

$3y \div 3 = 18 \div 3$  ← Undo the “ $\times$ ”.

$y = \underline{6}$

**Steps**

**1st** Undo the “+” or “-”.

**2nd** Undo the “ $\times$ ” or “ $\div$ ”.

## Data Management

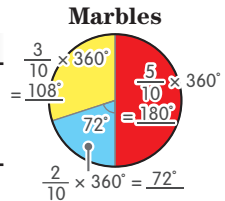
- **Making Circle Graphs**

**1st** Find the size of the angle for each group.

**2nd** Graph each group in a circle graph using a protractor.

e.g.

Marble	Number
red	5
blue	2
yellow	3
Total	10



## Probability

- **Experimental Probability**

the likelihood of an event occurring, determined from experimental results

- **Theoretical Probability**

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



## Grammar

## Subject-verb Agreement

The verb in a sentence must agree with its subject in both person and number.

- A singular subject takes a singular verb.
- A plural subject takes a plural verb.

e.g. One of the girls sings. The others dance.

singular  
subject

singular  
verb

plural  
subject    plural  
verb

- With indefinite pronouns like “everybody” and “nothing”, singular verbs are used.

e.g. Someone is knocking on the door.

indefinite    singular verb  
pronoun

## Active and Passive Voice

The active voice focuses on the doers of the action while the passive voice puts emphasis on the thing or person being acted upon.



e.g. The cat has broken the vase. (active voice)

The vase has been broken. (passive voice)

## Verbals

A verbal is a form of a verb that does not act as a verb in a sentence.

There are three types of verbals:

- **Gerund** – “ing” form of a verb; acts as a noun
- **Participle** – present/past participle; acts as an adjective
- **Infinitive** – “to” form of a verb; acts as a noun, an adjective, or an adverb

e.g. Painting is my favourite pastime.

gerund

Aiden’s hat was blown away by the raging wind.

participle

Kitty wants to explore Iceland.

infinitive



## Phrases

A phrase is a group of words that can take the same spot in a sentence as a single word.

### Noun Phrase

- a group of words that includes a noun as head and all its modifiers
- functions like a single noun
- may be the subject, object, or complement of the sentence

### Verb Phrase

- a group of words with a verb as head
- functions as a single verb

### Verbal Phrase

- contains a gerund, a participle, or an infinitive
- functions as a noun, an adjective, or an adverb

### Adjective Phrase

- has one or more adjectives as head
- functions like a single adjective

### Adjectival Phrase

- can be any phrase that functions like an adjective
- usually hyphenated when preceding the noun it modifies

### Adverb Phrase

- describes a verb, an adjective, or an adverb
- functions like a single adverb

### Prepositional Phrase

- has a preposition as head
- modifies a noun like an adjective or a verb, an adjective, or an adverb like an adverb

e.g. They put on interesting costumes from the new shop.  
as an adjective modifying "costumes"



## Clauses

A clause is a group of words that consists of a subject and a predicate.

### Coordinate Clauses

- clauses linked by coordinating conjunctions, such as “and”, “or”, and “but”

### Subordinate Clause

- depends on another clause to complete its meaning
- linked to the clause it depends on by a subordinating conjunction like “when”, “if”, and “since”

### Noun Clause

- a clause that functions as a noun  
e.g. Ken was eager to know what he would see in China.



### Adverb Clause

- functions as an adverb in a sentence
- gives additional information about when, where, why, or how something happens  
e.g. Before you go on the trip, make sure you do some research.

### Relative Clause

- a subordinate clause that helps identify someone or something or provides information about it
- linked to the part of the sentence it describes with a relative pronoun or a relative adverb
- can be defining or non-defining

#### Defining Relative Clause

identifies or describes a particular person or thing

#### Non-defining Relative Clause

provides additional information about someone or something; separated from the main sentence by commas

## Types of Sentences

There are several types of sentences.

### Simple Sentence

- one single clause

### Compound Sentence

- two or more coordinate clauses linked by “and”, “or”, or “but”

### Complex Sentence

- one main clause joined to one or more subordinate clauses with subordinating conjunctions

### Compound-complex Sentence

- two or more coordinate main clauses with one or more subordinate clauses

## Punctuation

There are many punctuation marks that are used for different purposes.

:	;	–	( )	“ ”
colon	semicolon	dash	parentheses	quotation marks

**:** to set off a list, a quotation, or an explanation

**;** to separate long items in a list, especially when they contain commas within, or to separate closely related independent clauses

**–** to insert or set off appositions and explanations to further the reader’s understanding of the sentence

**( )** to enclose phrases or statements as additional information that is not an essential part of the main statement and that does not normally fit into the flow of the text

**“ ”** to enclose direct quotations or fragments of quotations, words or phrases used with special meanings, and titles of short stories, articles, and poems

e.g. I have invited three people to my recital: my mom, Laura; my dad, Greg; and my sister, Rita. Rita is excited (she loves ballet too) so I will do my best tonight.

## New France and British North America, 1713 – 1800

Life in New France and British North America was not easy. Daily life was filled with hard labour and chores, and people faced expulsion and war.

### Seigneurial System

- the king of France owned all the land and allocated large areas to seigneurs
- the seigneurs divided their land among habitants
- the habitants paid taxes, performed free labour, and gave parts of their harvest to the seigneurs

### Acadia

- Acadia was a colony in New France
- caught in the middle of a rivalry between France and Britain
- the Acadians were deported to the Thirteen Colonies

### Seven Years' War

- fought between France and Britain over North America

## Canada, 1800 – 1850

The early 19th century saw a drastic rise in Canada's population due to mass immigration. This had both positive and negative consequences.

### Immigration

British and Irish immigrants came to Canada for a better life but they faced challenges as the journey to Canada was strenuous and people often died from illness. They also brought new diseases into Canada, such as cholera, which became an epidemic. The epidemic resulted in the establishment of public health organizations.

### The Timber Trade

It was a major industry in Upper and Lower Canada. It provided employment, encouraged immigration, and boosted the colonies' economy.



## Natural Resources and Landforms

The Earth's constantly changing natural processes physically affect the land, creating new landforms and changing existing ones. Mountain ranges, for example, are created by the Earth's tectonic plates colliding and lifting huge pieces of surface rock upward.

### Climate Patterns

A climate pattern is the recurring characteristic of a climate, which is affected by a complex combination of factors.

#### Factors Affecting Climate Patterns

- latitude
- elevation
- ocean currents
- closeness to water



### Natural Vegetation



Regions around the world can be mapped according to their local vegetation.

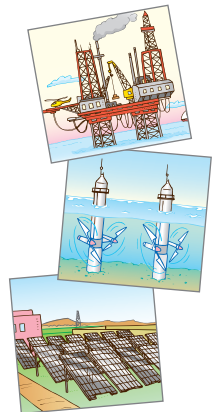
e.g. Tropical rainforests are found in countries along the equator.

## Natural Resources around the World

There are three types of natural resources:

- **Renewable Resources:** can be regenerated/replenished
- **Non-renewable Resources:** cannot be replaced
- **Flow Resources:** must be used as they occur

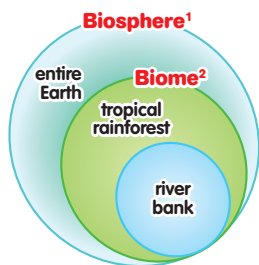
Water is one of the most precious natural resources. People, plants, and animals cannot survive without water. It is used in transportation, recreation, agriculture, household purposes, and power generation. However, many countries are now experiencing water scarcity, so sustainable practice is being encouraged by various groups and organizations to protect and conserve the Earth's natural resources.



## Ecosystem

The system of interaction between living and non-living things in an area is called an ecosystem. Ecosystems can be any size, with smaller ecosystems found inside larger ones.

### Interactive Ecosystems



- 1:** including all land surface, water, atmosphere, and living things
- 2:** a large area defined by similar plants, animals, weather patterns, and its landforms

There are biotic and abiotic elements in an ecosystem.

### Biotic Elements

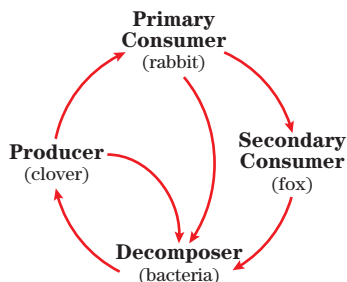
- living members
- having lived members  
e.g. plants, animals

### Abiotic Elements

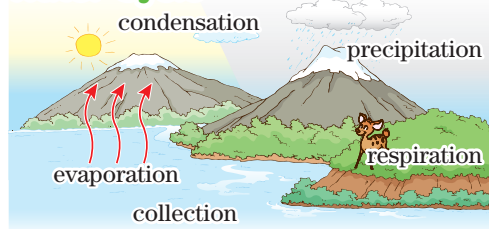
- non-living members
- never having lived members  
e.g. soil, water

## Food Cycle

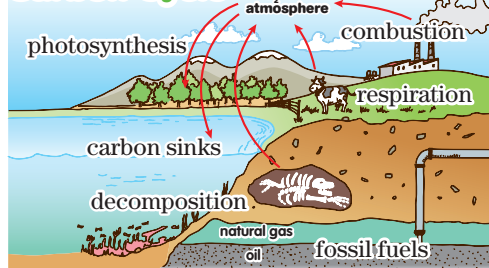
The food cycle is made up of producers, consumers, and decomposers.



## Water Cycle



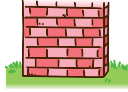
## Carbon Cycle



## Structures

Structures are things with a definite size and shape. Human-made structures are based on structures found in nature. Structures can be made of one part or many parts and can be classified as the following:

### Solid Structure



- mostly matter
- made of more than one part
- the parts are stacked or piled close together

### Frame Structure



- a framework that supports other parts of the structure

### Shell Structure



- protective
- blocks entry or exit

## Forces on Structures

Structures are made to withstand forces. There are different types of forces.

### External Force

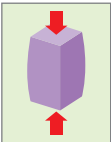
An external force of weight upon a structure is a load.



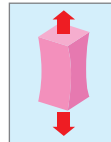
**a live load**  
one that is not part of the structure itself

**a dead load**  
the weight of the structure itself

### Internal Force



**Compression Force**  
occurs when a load pushes upon a structure



**Tension Force**  
a force that pulls



**Shear Force**  
where different parts of the structure press in opposite directions



**Torsion Force**  
the twisting of an object in opposite directions



## The Particle Theory of Matter

The particle theory of matter describes what makes up all matter. Particles of matter behave in different ways, depending on the state of the matter.



**Solid**

particles are closely packed together



**Liquid**

particles are close together and can move freely past one another

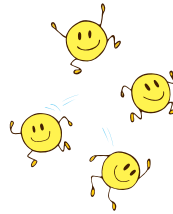


**Gas**

particles are far apart and can move freely from place to place

### Particle Theory of Matter

- All matter is made up of tiny particles.
- Particles are always moving.
- There are spaces between particles.
- Heat causes particles to move faster.



## Heat

Heat, also called thermal energy, is the energy in the particles of a substance. It is a result of the vibration of particles. It can be transferred from one substance to another.

### Major Heat Producers

- chemical energy
- mechanical energy
- electrical energy
- nuclear energy
- geothermal energy
- solar energy

### Transmission of Heat



**Conduction** – heat is transferred from one substance to another through direct physical contact



**Convection** – heat is transferred when warmer and less dense liquid or gas moves upward to make way for colder and denser liquid or gas



**Radiation** – heat travels through air (or space) from an object that radiates heat to another that absorbs it

## **I have learned concepts in these subject areas:**

### **Math**

- ✓ Number Sense and Numeration
- ✓ Measurement
- ✓ Geometry and Spatial Sense
- ✓ Patterning and Algebra
- ✓ Data Management and Probability

### **English**

- ✓ Grammar
- ✓ Oral Communication
- ✓ Reading
- ✓ Writing

### **History and Geography**

- ✓ New France and British North America
- ✓ Canada, 1800 – 1850
- ✓ Physical Patterns in a Changing World
- ✓ Natural Resources around the World

### **Science**

- ✓ Life Systems
- ✓ Structures and Mechanisms
- ✓ Matter and Energy
- ✓ Earth and Space Systems