GRADE 6 MATHEMATICS

Perimeter, Area, Volume & Capacity

Revision Booklet

Read through this booklet to review the key ideas.

Then test yourself at: **learnlattice.org/students/exam-revision**

Name: _____

Class: _____

Date: _____

MYP Key Concept: Relationships
Global Context: Scientific and Technical Innovation

Section 1: Perimeter

Perimeter is the **total distance around the outside** of a 2D shape. You find it by adding up all the side lengths.

Key Formulas

Shape	Formula	Key
Rectangle	P = 2(l + w)	l = length, w = width
Square	P = 4s	s = side length
Triangle	P = a + b + c	a, b, c = side lengths
Circle (circumference)	C = 2πr or C = πd	r = radius, d = diameter

Remember

Perimeter is always measured in **length units** (cm, m, km). It is a one-dimensional measurement — a distance.

Worked Example

Find the perimeter of a rectangle with length 12 cm and width 5 cm.

P = 2(l + w) = 2(12 + 5) = 2 × 17 = **34 cm**

Section 2: Area

Area is the **amount of space inside a 2D shape**. It tells you how much surface the shape covers.

Key Formulas

Shape	Formula	Key
Rectangle	$A = l \times w$	l = length, w = width
Square	$A = s^2$	s = side length
Triangle	$A = \frac{1}{2} \times b \times h$	b = base, h = perpendicular height
Parallelogram	$A = b \times h$	b = base, h = perpendicular height
Circle	$A = \pi r^2$	r = radius

> **Common Misconception**
>
> The **height** of a triangle or parallelogram must be the **perpendicular height** — the vertical distance from the base to the top. It is NOT the slant side.

Worked Example

Find the area of a triangle with base 10 cm and height 7 cm.

$A = \frac{1}{2} \times b \times h = \frac{1}{2} \times 10 \times 7 =$ **$35\ cm^2$**

> **Units**
>
> Area is always measured in **squared units** (cm^2, m^2, km^2). This is because you are multiplying two lengths together.

Section 3: Surface Area

Surface area is the **total area of ALL the faces** of a 3D shape. Imagine unfolding the shape into a flat net — the surface area is the area of that net.

Key Formulas

Shape	Formula	Key
Rectangular prism	$SA = 2(lw + lh + wh)$	l, w, h = dimensions
Cube	$SA = 6s^2$	s = side length

Worked Example

Find the surface area of a rectangular prism with length 8 cm, width 5 cm, and height 3 cm.

SA = 2(lw + lh + wh) = 2(8×5 + 8×3 + 5×3) = 2(40 + 24 + 15) = 2 × 79 = **158 cm²**

> **Tip**
> A rectangular prism has 6 faces arranged in 3 pairs of identical rectangles. Calculate the area of each pair, add them up, then multiply by 2.

Section 4: Volume

Volume is the **amount of space inside a 3D shape**. It tells you how much space the object takes up.

Key Formulas

Shape	Formula	Key
Rectangular prism	V = l × w × h	l, w, h = dimensions
Cube	V = s³	s = side length
Triangular prism	V = (½ × b × h) × l	b, h = triangle base & height; l = length

> **Units**
> Volume is always measured in **cubed units** (cm³, m³). This is because you are multiplying three lengths together.

Worked Example

Find the volume of a triangular prism where the triangle has base 6 cm and height 4 cm, and the prism is 10 cm long.

V = (½ × b × h) × l = (½ × 6 × 4) × 10 = 12 × 10 = **120 cm³**

Section 5: Capacity

Capacity is the **amount of liquid a container can hold**. It is closely related to volume — the key is knowing the conversion.

Key Conversions

Conversion	Rule	Example
cm³ to mL	1 cm³ = 1 mL (exact)	500 cm³ = 500 mL
m³ to L	1 m³ = 1,000 L	0.5 m³ = 500 L
L to mL	1 L = 1,000 mL	2.5 L = 2,500 mL

The Golden Rule

1 cm^3 = 1 mL. This is the most important conversion in this unit. If you can find the volume in cm^3, you immediately know the capacity in mL.

Worked Example

A fish tank is 60 cm long, 30 cm wide, and 40 cm high. How many litres of water does it hold?

$V = l \times w \times h = 60 \times 30 \times 40 = 72{,}000\ cm^3$

72,000 cm^3 = 72,000 mL = **72 L**

Quick Reference: All Formulas

Measurement	Shape	Formula
Perimeter	Rectangle	$P = 2(l + w)$
Perimeter	Circle	$C = 2\pi r$ or $C = \pi d$
Area	Rectangle	$A = l \times w$
Area	Triangle	$A = \frac{1}{2} \times b \times h$
Area	Parallelogram	$A = b \times h$
Area	Circle	$A = \pi r^2$
Surface Area	Rectangular prism	$SA = 2(lw + lh + wh)$
Surface Area	Cube	$SA = 6s^2$
Volume	Rectangular prism	$V = l \times w \times h$
Volume	Cube	$V = s^3$
Volume	Triangular prism	$V = (\frac{1}{2} \times b \times h) \times l$
Capacity	Any shape	1 cm^3 = 1 mL; 1 m^3 = 1,000 L

Units Checklist

Perimeter → cm, m, km (length) • Area → cm^2, m^2 (squared) • Volume → cm^3, m^3 (cubed) • Capacity → mL, L (liquid)

Ready to practise? Complete the interactive review at: **learnlattice.org/students/exam-revision**