# THE SUPPLEMENT EDUCATIONAL SERIES. PUBLISHED MONTHLY. NO. 3. PRACTICAL MENSURATION FOR SCHOOLS AND COLLEGES

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W. V. WRIGHT

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Trieste

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No. 3.

# PRACTICAL MENSURATION

FOR

## SCHOOLS AND COLLEGES.

BY

W. V. WRIGHT, B.A.

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# AUTHOR'S NOTE.

THIS book aims at furnishing work in *practical measurements* suitable for beginners — boys and girls having a fair knowledge of the elementary rules of arithmetic. The necessary technical information will be found in the introductory pages. The teacher should supplement these pages by the free use of blackboard and crayon. Except in the test papers at the end, the exercises do not presuppose a knowledge of geometry or of square root. The book is not, in the ordinary sense, mathematical. The matter of a large number of the exercises was built upon information secured by actual conversations with intelligent mechanics. The author hopes that the free use of this book in the school-room will aid in bringing the education of the mind more into harmony with the needs of every-day life.

PICKERING, October 19, 1887.

# PRACTICAL MENSURATION.

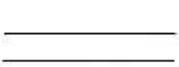
## NOTES AND DEFINITIONS.

The subject of **mensuration**, as here treated, includes only such practical applications of the measures of surfaces, measures of volume, and measures of capacity, as are of common use.

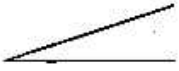
A **straight line** is a line which does not change in its direction.



**Parallel lines** are lines which always remain the same distance from each other, however far they may be produced.

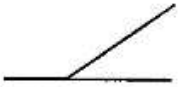


The opening between two straight lines drawn from the same point is called an **angle**.

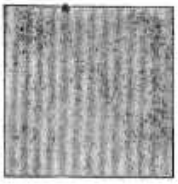


When two straight lines cross each other so as to form four equal angles, the angles are called **right angles**.

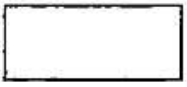
An angle greater than a right angle is called an **obtuse angle**, and an angle less than a right angle is called an **acute angle**.



A **surface** has length and breadth without thickness. A *plane* surface is a *level* surface. The amount of space over which a surface extends is called its **area**. The *area* of the accompanying figure is *one square inch*.



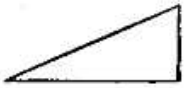
A surface bounded by four straight lines, and having four right angles, is called a **rectangle**.



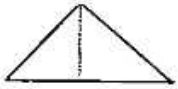
A *rectangle* is called a **square** when its four sides are equal.

The line joining two opposite corners of a square or rectangle is called the **diagonal.**

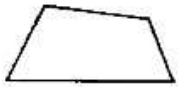
A plane figure bounded by three straight lines is a **triangle.** The **base** of a triangle is the side on which it is supposed to rest.



The **altitude** of a triangle is the perpendicular distance from the angle opposite the base to the base, or to the base produced.

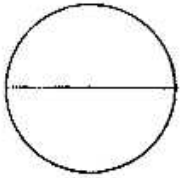


A four-sided plane figure having no two sides parallel is called a **trapezium.**

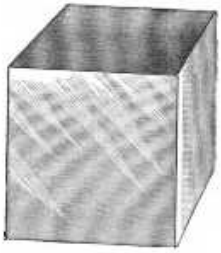


The **perimeter** of a plane figure is the sum of its sides.

A **circle** is a plane figure bounded by a curved line, every point of which is equally distant from a point within, called the **centre.** The boundary line is called the **circumference.** A straight line drawn through the centre and terminating at the circumference on both sides is called a **diameter.** A straight line drawn from the centre to the circumference is called a **radius.**



A **solid** has length, breadth, and thickness, or height. A **cube** is a solid figure contained by six equal squares. A **rectangular solid** is a solid figure contained by six angular surfaces.



The **volume** of a rectangular solid is the portion of space which it occupies.

A solid bounded by a curved surface, every point of which is equally distant from a point within, called the centre, is called a **globe**, or **sphere.**

A **cylinder** is a solid figure described by the revolution of a rectangle about one of its sides which remains fixed. An uncut lead-pencil is an example.

## MEASUREMENT TABLES.

**Linear measure** is used in measuring lengths and distances. The table is as follows:

| | | | | |
|---|---|---|---|---|
| **12 inches** | = | **1 foot** | . . . . | *ft.* |
| **3** feet | = | **1 yard** | . . . . | *yd.* |
| **5½** yards (16½ feet) | = | **1 rod** | . . . . | *rd.* |
| **320** rods | = | **1 mile** | . . . . | *mi.* |

***Remember that 1 mile equals 1,760 yards.***

**Surveyor's** lineal measure is used by surveyors in measuring land and distances. The table is as follows:

| | | | | |
|---|---|---|---|---|
| **7.92** inches | = | **1 link** | . . . . | *l.* |
| **25** links | = | **1** rod | . . . . | *rd.* |
| **100** links (4 rods) | = | **1 chain** | . . . . | *ch.* |
| **80** chains | = | **1** mile | . . . . | *mi.* |

***Remember that a chain equals 66 feet or 4 rods.***

**Surface measure** is used in measuring surfaces. The table is as follows:

| | | | | |
|---|---|---|---|---|
| **144 square inches** | = | **1 square foot** | . | *sq. ft.* |
| **9** square feet | = | **1 square yard** | . | *sq. yd.* |
| **30¼** square yards | = | **1 square rod** | . | *sq. rd.* |
| **160** square rods | = | **1 acre** | . . . . | *A.* |
| **640** acres | = | **1 square mile** | . | *sq. mi.* |

***A square measuring 208.71+ feet on each side contains 1 acre.***

**Surveyor's** square measure is used by surveyors in computing the area of land. The table is as follows:

| | | | | |
|---|---|---|---|---|
| **625 square links** | = | **1 square rod** | . | *sq. rd.* |
| **16** square rods | = | **1 square chain** | . | *sq. ch.* |
| **10** square chains | = | **1 acre** | . . . . | *A.* |

***An acre equals 4840 square yards.***

**Cubic measure** is used to measure the contents or volume of solids. The table is as follows:

| | | | | |
|---|---|---|---|---|
| **1728 cubic inches** | = | **1 cubic foot** | . | *cu. ft.* |
| **27** cubic feet | = | **1 cubic yard** | . | *cu. yd.* |
| **128** cubic feet | = | **1 cord** | . . . . | *cd.* |