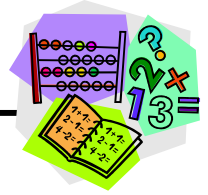# Linear Measurement: Metric and Imperial

Linear measurement is when you measure things in a straight line using tools such as a ruler, yardstick or tape measure. The following table shows different types of linear measurement.

Note: Metric and/or imperial units can be used to measure linear measurements.

> **Examples**

One example is provided for each type of linear measurement. Complete the right column of the chart by listing other everyday examples of linear measurement.

Type of Linear Measurement	Examples
Distance	a) distance from home to school b)
Width	a) width of a television b)
Height	a) height of a volleyball net b)
Depth	a) depth of a lake b)
Thickness	a) thickness of your notebook b)
Perimeter	a) distance around the edge of the basketball court b)
Circumference	a) distance around the outside of the centre circle on the hockey rink b)

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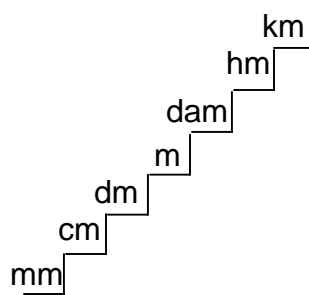
Measuring Length: Metric System

The base unit for length is the **metre (m)**.

Units used to measure length depend on what is being measured. For example,
- distance between towns and cities is measured in kilometres
- width of a textbook is measured in millimetres or centimetres
- height is measured in metres and centimetres.

Metric Staircase

km
hm
dam
m
dm
cm
mm

Hint: Use this ACRONYM to help you remember the order of the units:
King
Henry's
Daughter
Betty
Detested
Counting
Money

Measuring Length: Imperial System

Units for measuring length in the imperial system are inches, feet, yards and miles.

12 inches = 1 foot
3 feet or 36 inches = 1 yard
1760 yards or 5280 feet = 1 mile

Symbols/abbreviations:

inch	=	in. or "	1 in. or 1"
foot	=	ft. or '	1 ft. or 1'
yard	=	yd. or yds.	1 yd.
mile	=	mi.	1 mi.

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Inches and fractions of inches (e.g., $\frac{1}{8}$ of an inch) are used when measuring small things, such as the length, width and height of a table, desk or book.

Feet and **yards** are used to take larger measurements, such as the height of a door (ft.) or the distance from the school to the school yard (ft. or yds.).
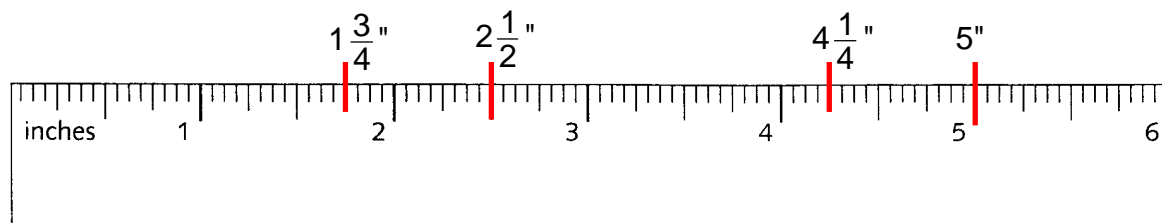
Miles are used to measure longer distances.

Fractions and the Imperial System

The whole numbers—1, 2, 3, etc.—on an imperial ruler represent an inch. Each inch is divided into 16 smaller parts. The half and quarter inches are shown with the slightly longer line segments.

Examples > Look at the inches and fractions of inches identified on the ruler below.

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Practice: Estimating and Recording Linear Measurements

1. With a partner, use a metre stick to measure 1 metre of the classroom floor. Mark 1 m with a piece of tape or chalk.

2. Measure and record the height in centimetres of your partner and other students using a metre stick or metric tape measure. Almost everyone in your class will be between 1 and 2 metres tall. Measure and convert to m.

    For example, a student may be 137 cm tall, which is 1.37 m. Another may be 124 cm tall, which is 1.24 m.

3. Measure your stride, then estimate a variety of measurements inside or outside the school by walking lengths and widths. Take measurements using a measuring tool. Compare your estimated and real measurements.

    For example:
    *   length and height of playground equipment
    *   length and width of basketball, volleyball and badminton courts in the gym
    *   diameters of circles in the gym
    *   length and width of a classroom, library and hallways
    *   length and width of soccer or football field
    *   length and width of your school

4. With your classmates, complete a variety of activities that involve estimating and measuring distances. Or, organize a play day involving linear measurements for a group of younger students.

    Examples:
    *   ball throws and/or kicks
    *   sandpit jumps

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5. List common examples of items to measure:
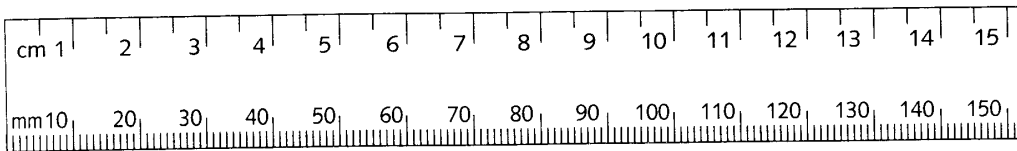
mm and/or inches, e.g., coin, _____, _____

cm and/or inches, e.g., thickness of a dictionary, _____, _____

m and/or yards, e.g., length of school yard, _____, _____

Discuss your examples with your classmates or teacher.

6. Use the illustration below, or find a metre-stick or other metric measuring tool to answer the following questions.

a) How many mm in 1 cm?
b) How many mm between 3 and 4 cm?
c) How many mm in 4 cm?
d) How many mm in 10 cm?

7. Measure items in the classroom and record their lengths in mm and cm, for example, a pen, pencil, piece of chalk, your notebook.

Items	Measurement	
	in mm	in cm

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8. Complete the table by estimating measurements. Discuss your estimates with classmates. Then measure and compare the actual measurements with your estimations. Include the appropriate units of measurement for each.

Measurement Required	Estimated Measurement	Actual Measurement
Distance from front to back of the room		
Your height or the height of a classmate		
Thickness of a textbook		
Height of your desk or table		
Perimeter of the room		
Depth of a sink (or water fountain)		
Other:		
Other:		

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