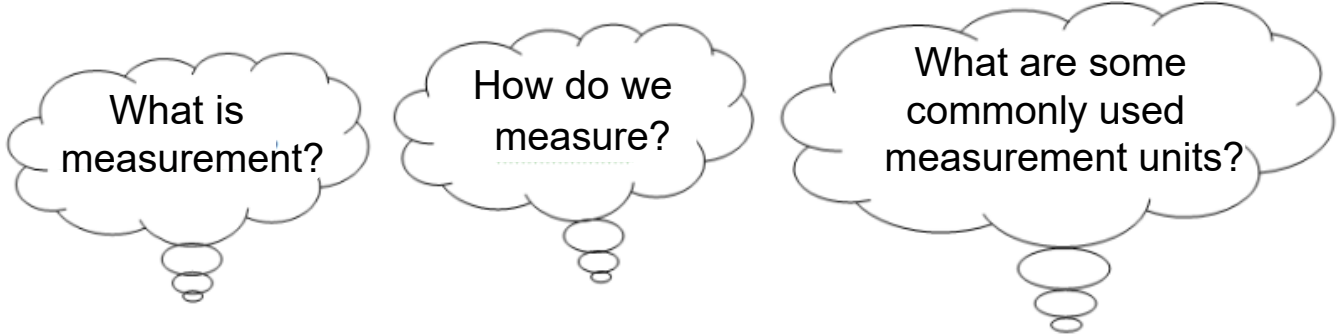


## Sec 1.1 and 1.2 Imperial Measures of Length



There are two systems we use to measure:

### 1) **SI System**

- based on metric system
- base unit for length is meters, m
- uses a base 10 system (powers of 10)
- used in Canada
- Examples:  
Speed of 100 km/h  
Olympics 100 m sprint

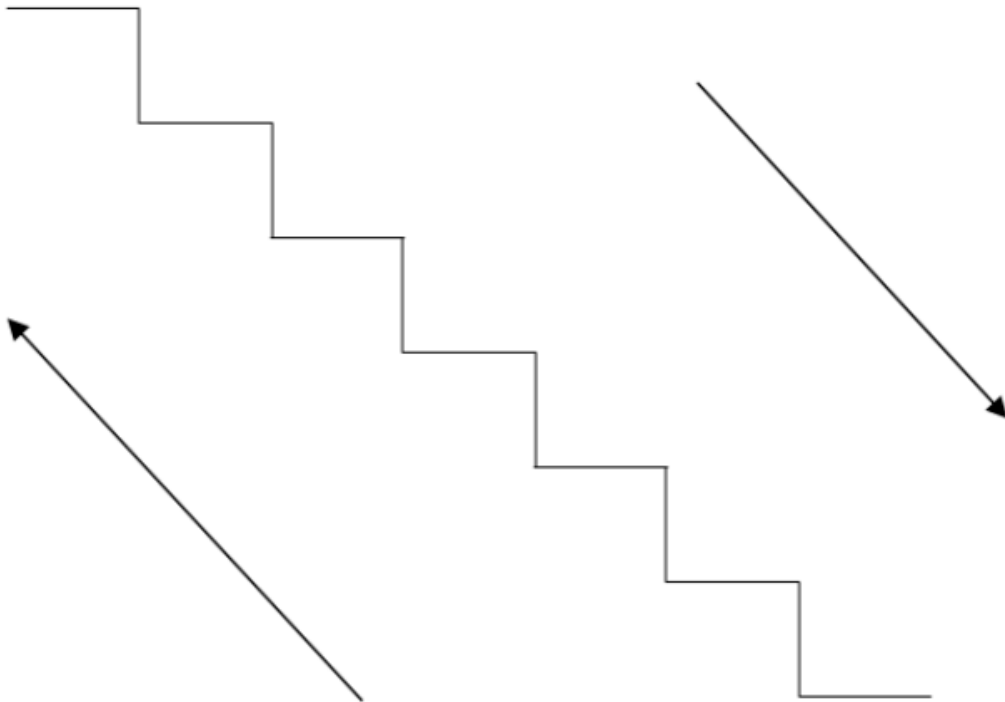
### 2) **Imperial System**

- length may be measured in inches, in. symbol is "  
feet, ft. symbol is '  
yards, yd. and miles, mi.
- not base 10
- Examples:  
Construction: 2 by 4  
Sports: golf course or football field measured in yards, marathon in miles.

\*\*\* in some cases both systems are commonly used, for example, at the grocery store. Meat can be sold at a price per pound or price per 100g.

## Converting between Metric Units of Length

kilo	hecto	deca	meter	deci	centi	milli
$10^3$	$10^2$	$10^1$	$10^0$	$10^{-1}$	$10^{-2}$	$10^{-3}$
1000	100	10	1	0.1	0.01	0.001
k	h	da	m	d	c	m



**Example 1** Convert each unit of measure.

a) 12 m = \_\_\_\_\_ cm

b) 372 mm = \_\_\_\_\_ m

c) 1.5 km = \_\_\_\_\_ m

d) 62 m = \_\_\_\_\_ km

## Example 2

Look around the classroom. Identify an object that can estimate:

- a) one foot
- b) one inch
- c) one yard



**Note:** A **referent** is an object that can be used to help estimate a measurement.

Some common referents for linear measurements include:

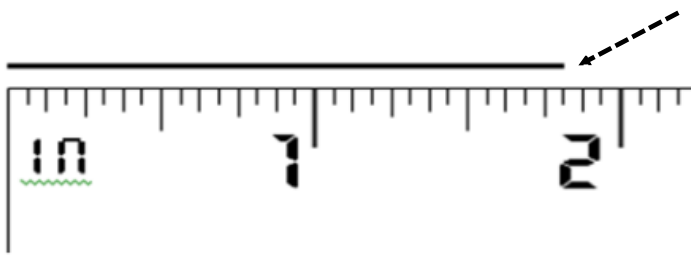
Referent	Description
1 mm	Thickness of a dime, thickness of a fingernail
1 cm	Width of a fingernail, width of black keys on a standard piano, width of a crayon, width of a paper clip
1 m	Distance from doorknob to the floor, width of volleyball net
1 km	Distance you can walk in about 15 minutes
1 in.	Thickness of a hockey puck, length from end of thumb to first knuckle
1 ft.	Length of a standard floor tile, foot length
1 yd.	Distance from the tip of the nose to the outstretched fingers (arm span)
1 mi.	Distance you can walk in 20 minutes

## Example 3

Using your thumb length as a referent for an inch, measure the length of your sheet of paper. What did you get? Will everyone get the same answer?

### Example 4

Refer to the imperial ruler below. How long is this line?



### Note:

To measure the length of an object, you must first determine the smallest indicated unit by counting the number of divisions between two adjacent inch marks.

A fraction of an imperial measure is written in fractional form NOT decimal form. Write as mixed fractions not improper fractions.

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### Converting between Imperial Units of Length

Remember imperial units are NOT base ten. To convert between imperial units we need to know the **conversion factors**.

$$1 \text{ ft} = 12 \text{ in.}$$

$$1 \text{ yd} = 3 \text{ ft} = 36 \text{ in.}$$

$$1 \text{ mi.} = 1760 \text{ yd} = 5280 \text{ ft}$$

### Example 5

a) Convert 5 yd to feet.

b) Convert 5 yd to inches.

**Strategy: Unit Analysis**

Use a conversion factor so that the unit in the numerator stays and the unit in the denominator cancels out.

**Example 6** Convert 51 in. to:

a). Feet and inches

b). Yards, feet and inches

**Note:**

Remember to write imperial units as mixed numbers.

**Example 7**

Anne is framing a picture. The perimeter of the frame is 136 in.

a) What is the perimeter in feet and inches?

b) The framing material is sold by the foot. It costs \$1.89/ft. What is the cost of the material before taxes?

**Example 8**

Alex purchased 7 yd. of ribbon to trim napkins. The ribbon is sewn around the napkin, which is 14 in. wide and 16 in. long. How many napkins can Alex trim with this ribbon?

**Work Book Questions**

p.11 #3abcde, 7abc, 8abc, 10ab,  
11a, 12, 13, 14abc, 15ab

**Extra Practice Questions**

p.11 #4a, 5a, 9, 18, 19