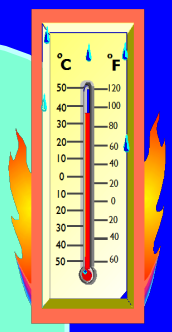
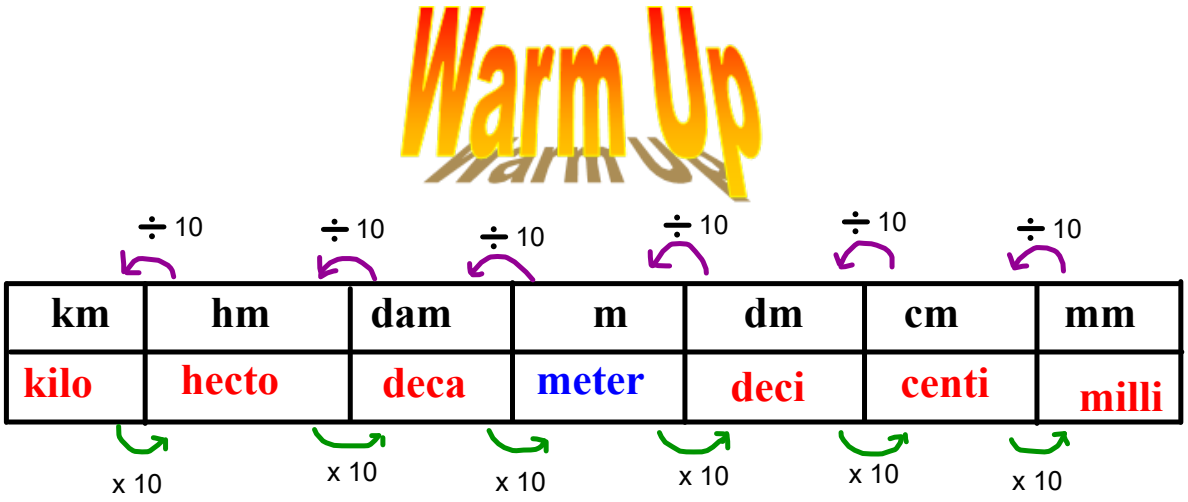
Chapter 4

System of Measurement and Conversions





1) Complete the following:

(a) 20 hg = 2 000 g

(b)425 km = 4 250 000dm

(c) 324 cm = 3.24 m

(d) 45 hm= 4.5 km

(e) 6 mm = 0.6 cm

(f) 79 dm= 0.79 dam

(g) 2500 m = _____ km

(h) 1234 mm= _____ m

(i) 6 kl = _____ dal

(j) 1500 dg =_____ g

SI also uses **base units**. The base unit for measuring length is the **meter (m)** and the base unit for measuring volume is the **litre (L)**. What is the base unit for measuring mass?

Grade 7

Review

SI Units of Measurement

Length

km	hm	dam	m	dm	cm	mm
kilo	hecto	deca	meter	deci	centi	milli

Weight (mass)

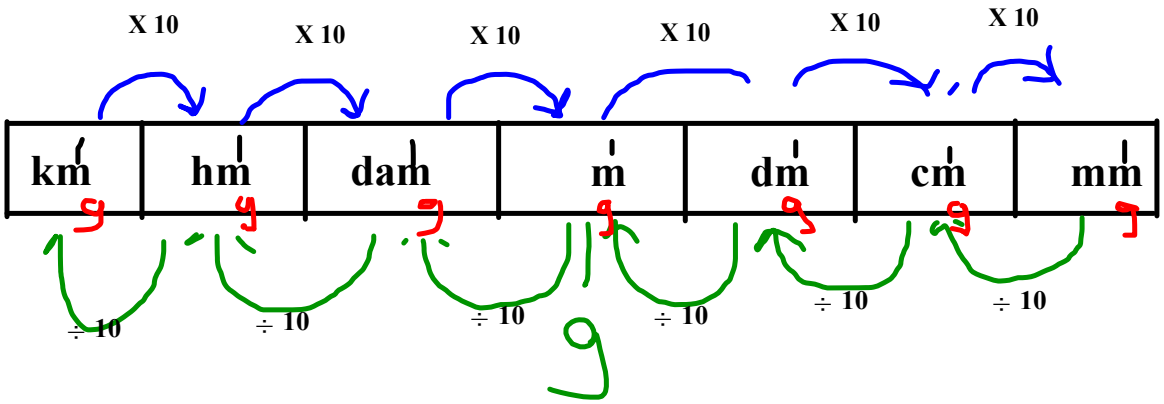
kg hg dag g dg cg mg

Liquid Volume

kl hl dal L dl cl ml

How do you change from one unit to another?

To change to the unit beside it, either multiply or divide by 10. If the unit is to the right, multiply, if the unit is to the left you divide.



Complete the following:

(a) 20 m = 2000 cm

(b) 321 dag = 3.21 kg

(c) 72 cm = 720 mm

(d) 82 hl = 8200 L

(e) 600 mm = 0.6 m

(f) 250 ml = 2.5 dl

(g) 5000 mg = 50 dg

(h) 3589 m = 3.589 km

(i) 62 kl = 6200 dal

(j) 15 dm = 1.5 m

If you are driving 100 kilometers per hour:

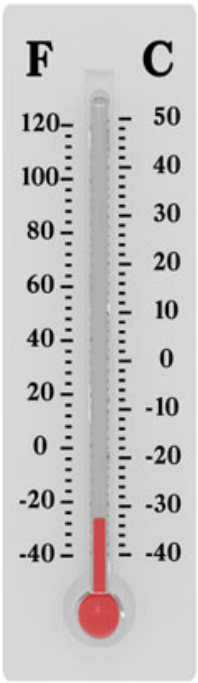
How fast are you driving in miles per hour?

approximately:

If you are driving 100 miles per hour:

How fast are you driving in kilometers per hour?

approximately:



If it is 20 degrees Celsius:

What is the temperature in degrees Fahrenheit?

approximately:

If it is 20 degrees Fahrenheit:

What is the temperature in degrees Celsius?

approximately:

We did the approximate value for the previous two examples however we will learn how to calculate the exact values using conversion formulas.

Activate Prior Learning: SI Units

Common SI units of length are the:

Kilometre, Metre, Centimetre, and Millimetre.

What are referents for these SI units?

Unit	Referent
Kilometre (km)	distance you could comfortably in 15 minutes
Metre (m)	width of a door
Centimetre (cm)	width of little finger
Millimetre (mm)	thickness of a dime

Systeme international d'unites (SI)

This is a measurement system commonly used in Canada. It is a decimal system based on multiples of 10. This means you can convert to other SI units simply by multiplying or dividing by a multiple of 10!

SI PREFIX	SI SYMBOL	SI UNIT CONVERSION FACTOR (STANDARD FORM)	FACTOR (POWER)	FACTOR LANGUAGE
tera	T	1 terametre = 1 000 000 000 000 metres	10^{12}	trillion
giga	G	1 gigametre = 1 000 000 000 metres	10^{9}	billion
mega	M	1 megametre = 1 000 000 metres	10^{6}	million
kilo	k	1 kilometre = 1 000 metres	10^{3}	thousand
hecto	h	1 hectometre = 100 metres	10^{2}	hundred
deca	da	1 decametre = 10 metres	10^{1}	ten
		1 metre = 1 metre	$\mathbf{10^{0}}$	**one**
deci	d	1 decimetre = 0.1 metres	10^{-1}	tenth
centi	c	1 centimetre = 0.01 metres	10^{-2}	hundredth
milli	m	1 millimetre = 0.001 metres	10^{-3}	thousandth
micro	µ	1 micrometre = 0.000 001 metres	10^{-6}	millionth
nano	n	1 nanometre = 0.000 000 001 metres	10^{-9}	billionth
pico	p	1 picometre = 0.000 000 000 001 metres	10^{-12}	trillionth
femto	f	1 femtometre = 0.000 000 000 000 001 metres	10^{-15}	quadrillionth

A list of prefixes is given in the chart above The basic unit of "metres" is used in the chart. Please note that the prefixes "kilo", "hecto", "centi" and "milli" are used very frequently (light blue); the prefixes "mega", "deca", "deci" and "micro" are are used less frequently (light red), while the remaining prefixes (light purple) are rarely used (other than for extremely large or small numbers in science).

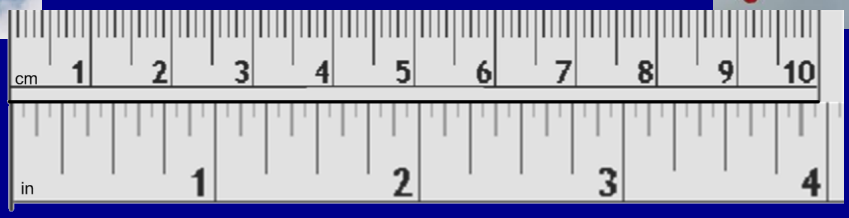
TABLE 1.5 Selected Prefixes Used in the Metric System

Prefix	Abbreviation	Meaning	Example
Giga	G	10^9	1 gigameter (Gm) $= 1 \times 10^9$ m
Mega	M	10^6	1 megameter (Mm) $= 1 \times 10^6$ m
Kilo	k	10^3	1 kilometer (km) $= 1 \times 10^3$ m
Deci	d	10^{-1}	1 decimeter (dm) $= 0.1$ m
Centi	c	10^{-2}	1 centimeter (cm) $= 0.01$ m
Milli	m	10^{-3}	1 millimeter (mm) $= 0.001$ m
Micro	μ[a]	10^{-6}	1 micrometer (μm) $= 1 \times 10^{-6}$ m
Nano	n	10^{-9}	1 nanometer (nm) $= 1 \times 10^{-9}$ m
Pico	p	10^{-12}	1 picometer (pm) $= 1 \times 10^{-12}$ m
Femto	f	10^{-15}	1 femtometer (fm) $= 1 \times 10^{-15}$ m

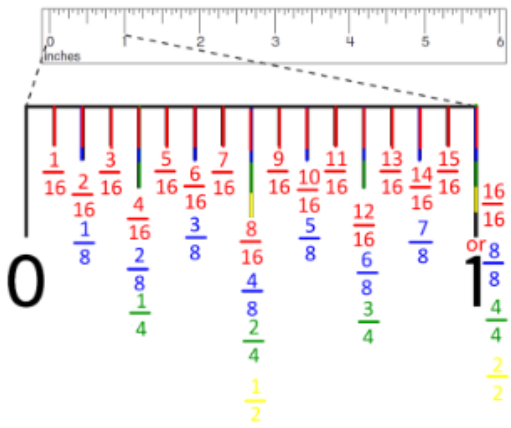
[a]This is the Greek letter mu (pronounced "mew").

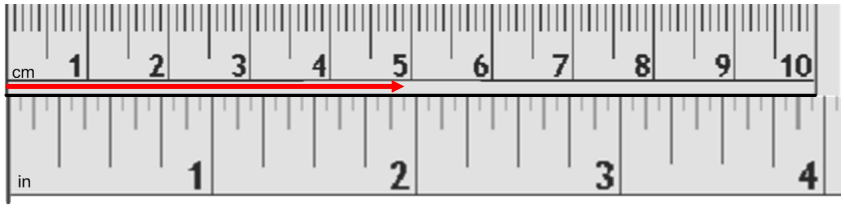
We say centimeter our neighbors to the south say inches

WHY?

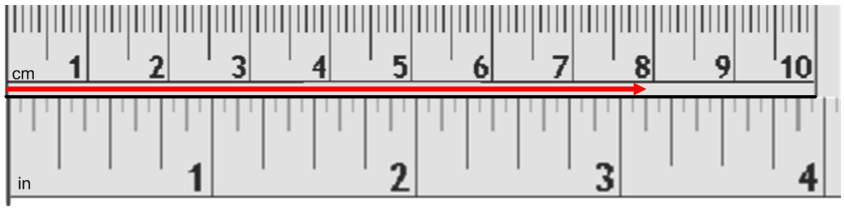


Fractional Units of Length

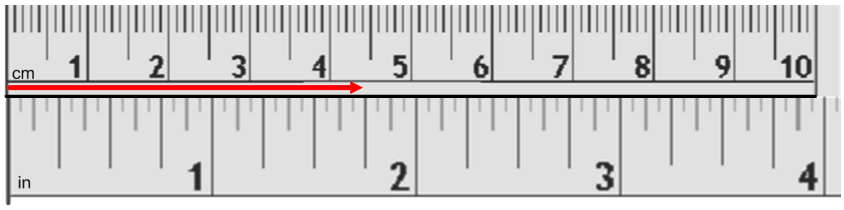




$1\frac{15}{16}$" , inches



$3\frac{1}{8}$"



$1\frac{12}{16} = 1\frac{3}{4}$"

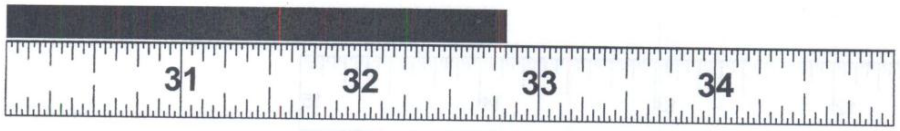
Geometry, Measurement and Finance 10
Assignment – Measuring in an Imperial System

Name: _____
January 2013

INSTRUCTIONS: Put your answer in the blank that is provided. Make sure all fractions are completely reduced.

Reading a Standard Ruler

How many Inches ?



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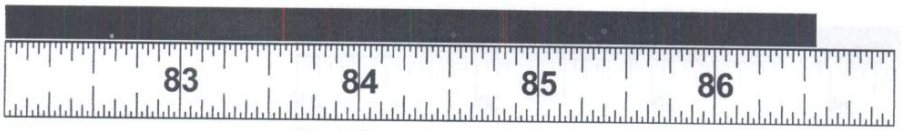

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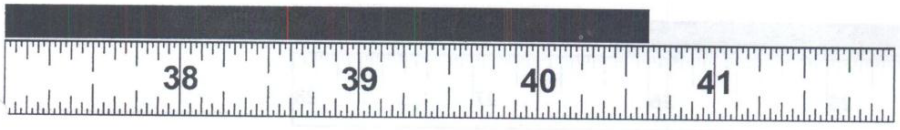

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Attachments

Assignment - Measuring in an Imperial System.pdf

Day 1_adding and Subtracting Fractions.ks-ipa