

Si Units

February 2, 2017 10:44 AM

SI Units (*Système international d'unités*)_the standard international system of units were created in the 1700's during the French Revolution.

This system uses predetermined prefixes that scale a measurement

Prefix	Scale factor (Scientific Notation)	Scale Factor
n: nano	$\times 10^{-9}$	0.000000001
μ : micro	$\times 10^{-6}$	0.000001
m: milli	$\times 10^{-3}$	0.001
c: centi	$\times 10^{-2}$	0.01
d: deci	$\times 10^{-1}$	0.1
da: deca	$\times 10^1$	10
h: hecta	$\times 10^2$	100
k: kilo	$\times 10^3$	1000
M: mega	$\times 10^6$	1000000
G: giga	$\times 10^9$	1000000000

Measuring Length

Lengths are always measured in meters. We use a prefix to help scale the measurement.

$$34 \text{ km} = 34 (1000) \text{ m}$$

$$34,000 \text{ m}$$

$$1 \text{ km} = 1000 \text{ m}$$

$$34 \cancel{\text{ km}} \times \frac{1000 \text{ m}}{1 \cancel{\text{ km}}} = 34,000 \text{ m}$$

$$540 \text{ cm} = 540 (0.01) \text{ m}$$

$$5.4 \text{ m}$$

$$1 \text{ m} = 100 \text{ cm}$$

$$540 \cancel{\text{ cm}} \times \frac{1 \text{ m}}{100 \cancel{\text{ cm}}} = 5.4 \text{ m}$$

$$4678 \text{ mm} = 4678 (0.001) \text{ m}$$

$$4.678 \text{ m}$$

$$1 \text{ m} = 1000 \text{ mm}$$

$$4678 \text{ mm} \times \frac{1 \text{ m}}{1000 \text{ mm}} = 4.678 \text{ m}$$

$$c: 0.01$$

$$2 \text{ cm} = 2 \times 10^{-2} \text{ m}$$

$$3 \text{ cm} = 3 (0.01) \text{ m} \checkmark$$

$$\underline{\underline{0.03 \text{ m}}}$$

$$k: 1000$$

$$0.56 \text{ km} = 0.56 (1000) \text{ m}$$

$$\underline{\underline{560 \text{ m}}}$$

$$c: 0.01$$

$$1 \text{ m} = 100 \text{ cm}$$

$$3 \text{ cm} \times \frac{1 \text{ m}}{100 \text{ cm}} = \underline{\underline{0.03 \text{ m}}}$$

$$1 \text{ km} = 1000 \text{ m}$$

$$0.56 \text{ km} \times \frac{1000 \text{ m}}{1 \text{ km}} = \underline{\underline{560 \text{ m}}}$$

Mass in SI units is measured in grams

Equivalency Equations

Yesterday you created your own equivalency Equations.



$$20 \text{ cm} = 2000 \text{ km}$$

$$100 \text{ cm} \times \frac{2000 \text{ km}}{20 \text{ cm}} = 10,000 \text{ km}$$

We can do the same with our different SI units.

$$1\text{km} = 1000\text{m}$$

$$1\text{m} = 100\text{cm}$$

$$1\text{cm} = 10\text{mm}$$

Etc.

We also use equivalency equations on maps

Referents: A referent is a personal measurement that you can use to make estimates.

The width of your pinky finger is approximately 1 cm
What would be some other referents?

$$1\text{mm} \simeq \text{Thickness of a finger nail}$$

$$1\text{ cm} \simeq \text{width of the pinky finger}$$

$$1\text{ m} \simeq \text{large Step}$$

$$1\text{km} \simeq 3 \text{ city blocks}$$

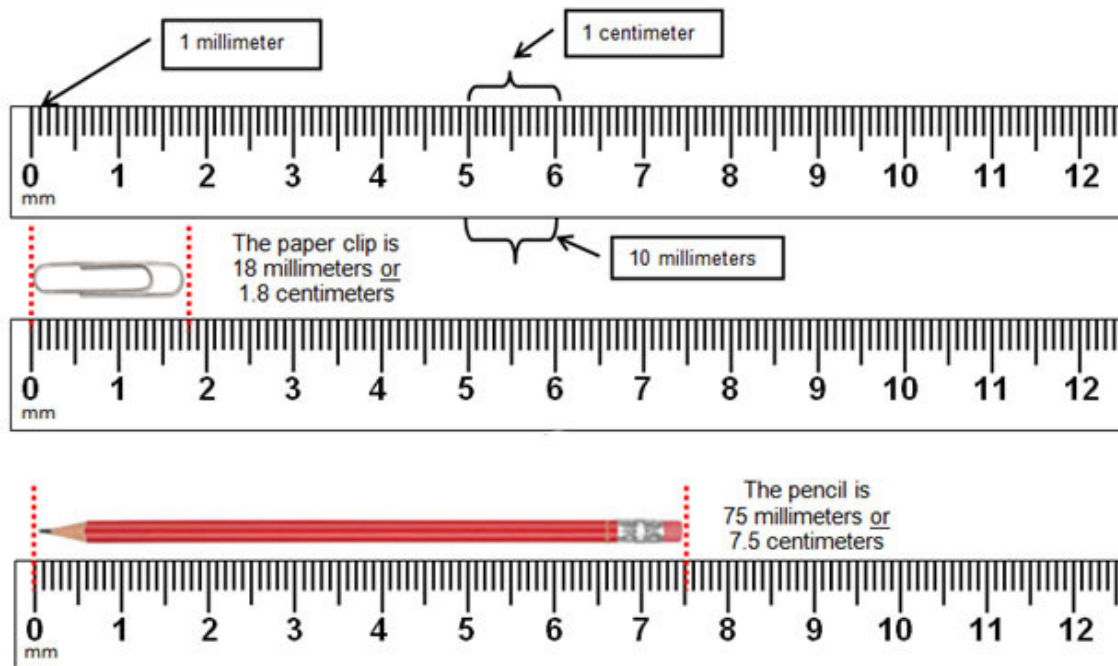
Using your referents: determine the following

$$\text{The height of your text book (in cm)} = 20 \sim 26 \text{ cm}$$

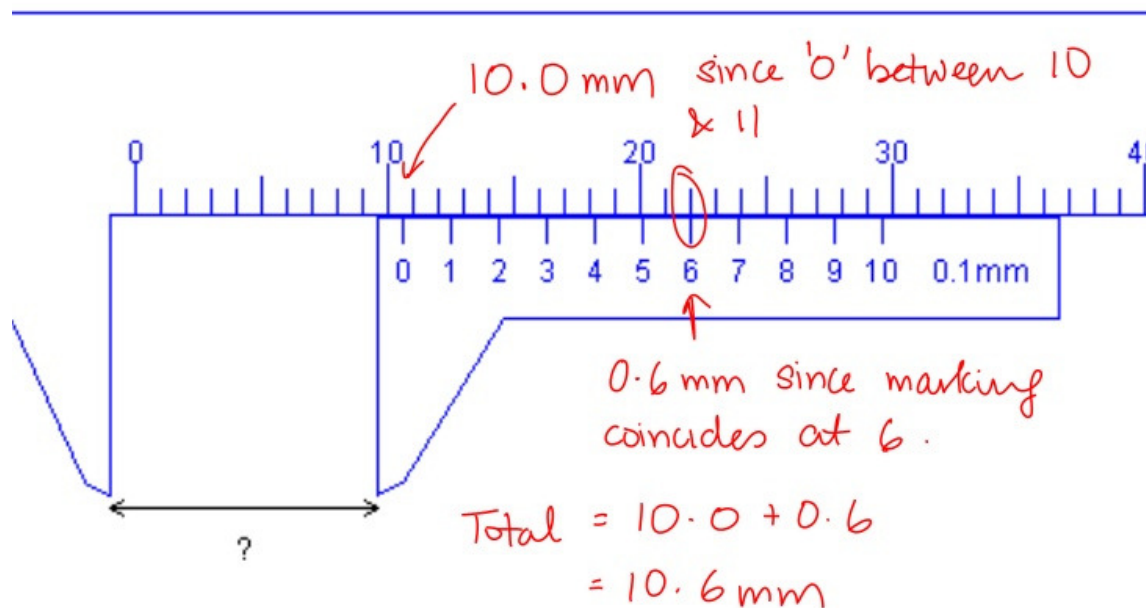
$$\text{The perimeter of the classroom (in m)} = 34 \sim 42 \text{ m}$$

HW: 1-15 odd
Pg 15

Reading a ruler



Reading a Caliper



#11
ratios