Exercise 1.1 Using Appropriate Units

In CHEM 1000 and 2000, you will be required to know and use the SI prefixes from pico to tera. The table below shows these prefixes applied to units for distance.

	units for small distances	units for large distances		
deci (d)	$10 \text{ dm} = 10^1 \text{ dm} = 1 \text{ m}$	deca (da)	$10 \text{ m} = 10^1 \text{ m} = 1 \text{ dam}$	
centi (c)	$100 \text{ cm} = 10^2 \text{ cm} = 1 \text{ m}$	hecto (h)	$100 \text{ m} = 10^2 \text{ m} = 1 \text{ hm}$	
milli (m)	$1\ 000\ mm = 10^3\ mm = 1\ m$	kilo (k)	$1\ 000\ m = 10^3\ m = 1\ km$	
micro (µ)	$1\ 000\ 000\ \mu\text{m} = 10^6\ \mu\text{m} = 1\ \text{m}$	mega (M)	$1\ 000\ 000\ m = 10^6\ m = 1\ Mm$	
nano (n)	$1\ 000\ 000\ 000\ nm = 10^9\ nm = 1\ m$	giga (G)	$1\ 000\ 000\ 000\ m = 10^9\ m = 1\ Gm$	
pico (p)	$1\ 000\ 000\ 000\ 000\ pm = 10^{12}\ pm = 1\ m$	tera (T)	$1\ 000\ 000\ 000\ 000\ m = 10^{12}\ m = 1\ Tm$	

Please make sure that the units cancel properly when doing unit conversions (as is done in all answer keys). Students who just multiply/divide by 10^x have a tendency to make preventable mistakes (usually by multiplying when they should have divided or vice versa).

1. For each of the following sentences, fill in the missing units *choosing a unit that makes the sentence make sense*. If the measurement in the sentence could be reported using more appropriate units, convert it into these units.

e.g.		"My favouri	te TV show is 36	500 lo	ng."	
	becomes	"My favouri	te TV show is 36	500 <u>seconds</u> lo	ong."	
	but sounds better as	"My favouri	te TV show is 1	hour long."		
(a)	My grandmother is 7	20	old.			
(b)	My younger brother	is 1	tall.			
(c)	The temperature was	only 270	so I had	d to wear a sw	eater.	
(d)	The density of water	is 1000	·			
2. (a)	Give an example of a µg	ın object whos (b)	e mass is best ex g	xpressed in: (c)	kg	
3.	The radius of a hydro	ogen atom is 0.	.529 Å. $(10^{10} \text{ Å} =$	<i>1 m)</i> Convert	t the radius of	a hydrogen atom:
(a)	into m	(b)	into pm	(c)	into nm	

4. Convert 100 nm^3 into pm^3 .