Vocabulaire DNL *Physique Chimie en anglais*

On dit bien:

- **Speed of light in a vacuum**
- **the Avogadro constant** ou **Avogadro's constant** (et elle peut être noté N_A)
- lorsqu'une unité est écrite en toutes lettres, elle commence par une minuscule (et on peut la mettre au pluriel):
  the SI unit of energy is **the joule (J)**; q is **in joules**
- **relationship** ou **equation** (pour une expression littérale) mais pas relation
- **approximation** pour une approximation en mathématique
- **diameter** (diam*etre* n'existe pas en anglais) (cf dictionnaire d'anglais)

En effet :

d'après le document trouvé sur internet Cambridge Pre-U Syllabus Chemistry (university of Cambridge)

(voir le lien http://www.cie.org.uk/docs/qualifications/preu/syllabuses/Pre-U%20Chemistry%20AC.pdf) :

Si on fait une recherche sur le mot relation dans ce document, on constate qu'il n'est utilisé que pour signifier « en relation avec » (in relation to) alors que le mot relationship est bien utilisé pour indiquer une relation mathématique entre des grandeurs.

Exemples : stoichiometric relationships

Candidates should be able to: (b) use the relationship $q = mc\Delta T$ (Equation 1 in the Data Booklet)

(b) use the relationship between energy and frequency, $E = hf$ (Equation 9 in the Data Booklet)

On trouve aussi: $q = mc\Delta T$ where q is heat produced in joules (J)

speed of light in a vacuum $c = 3.00 \times 10^8$ m s^{-1}

d'après "Physics through diagrams" publié par Oxford University Press:

Physical data

Physical quantity	Symbol	Value
speed of light in a vacuum	c	2.998×10^8 m s^{-1}
permittivity of free space	ε_0	8.854×10^{-12} F m^{-1}
permeability of free space	μ_0	$4\pi \times 10^{-7}$ H m^{-1}
proton rest mass	m_p	1.673×10^{-27} kg
neutron rest mass	m_n	1.675×10^{-27} kg
electron rest mass	m_e	9.110×10^{-31} kg
proton charge	e	1.602×10^{-19} C
electron charge	$-e$	-1.602×10^{-19} C
	(minus sign often omitted)	
specific charge: electron	e/m_e	1.759×10^{11} C kg^{-1}
Planck constant	h	6.626×10^{-34} J s
gravitational constant	G	6.672×10^{-11} N m^2 kg^{-2}
Avogadro constant	N_A	6.022×10^{23} mol^{-1}
universal molar gas constant	R	8.314 J K^{-1} mol^{-1}
Boltzmann constant	k	1.381×10^{-23} J K^{-1}
absolute zero		0 K, –273.15 °C
standard atmospheric pressure		1.013×10^5 Pa

Physical quantity	Symbol	Value
kilowatt hour	kW h	3.600×10^6 J
electronvolt	eV	1.602×10^{-19} J
unified atomic mass unit	u	1.661×10^{-27} kg
	(energy equivalent: 931.5 MeV)	
acceleration of free fall (mean, at Earth's surface)	g, g_0	9.807 m s^{-2}
mass of Earth		5.976×10^{24} kg
mass of Sun		1.989×10^{30} kg
mass of Moon		7.350×10^{22} kg
equatorial radius of Earth		6.378×10^6 m
mean distance of Earth from Sun		1.496×10^{11} m
mean distance of Moon from Earth		3.844×10^8 m
solar constant		1.352×10^3 W m^{-2}
astronomical unit	AU	1.496×10^{11} m
parsec	pc	3.086×10^{16} m
light year	ly	9.461×10^{15} m

Work

Work is done whenever a force makes something move.
It is calculated like this:

work done = force × distance moved in direction of force

The SI unit of work is the ***joule*** (J). For example, if a force of 2 N moves something a distance of 3 m, then the work done is 6 J.

Using dimensions or base units to check equations

Each term in the two sides of an equation must always have the same units or dimensions. For example,

work = force × distance moved
$[ML^2T^{-2}] = [MLT^{-2}] \times [L]$
$= [ML^2T^{-2}]$

An equation cannot be accurate if the dimensions on both sides do not match. It would be like claiming that '6 apples equals 6 oranges'.

Dimensions are a useful way of checking that an equation is reasonable.

d'après Physics, publié par Collins Advanced Science, UK

For speeds fairly close to the speed of light, use:

$$\gamma = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}$$

For speeds much smaller than the speed of light, you can use the approximation:

$$\gamma = 1 + \frac{v^2}{2c^2}$$

APPENDIX 2: DATA AND RELATIONSHIPS

A PHYSICAL CONSTANTS AND SYMBOLS

1 Fundamental physical constants

Constant	Preferred value	Units
Avogadro constant N_A	$6.022\ 136\ 7 \times 10^{23}$	mol^{-1}
Boltzmann constant k	$1.380\ 658 \times 10^{-23}$	$J\ K^{-1}$
electron charge e	$1.602\ 177\ 33 \times 10^{-19}$	C
electron rest mass m_e	$9.109\ 389\ 7 \times 10^{-31}$	kg
Faraday constant F	$9.648\ 530\ 9 \times 10^{4}$	$C\ mol^{-1}$
gravitational constant G	$6.672\ 59 \times 10^{-11}$	$N\ m^2\ kg^{-2}$
light speed in a vacuum c	$2.997\ 924\ 58 \times 10^{8}$	$m\ s^{-1}$
molar gas constant R	8.314 510	$J\ K^{-1}\ mol^{-1}$
neutron rest mass m_n	$1.674\ 928\ 6 \times 10^{-27}$	kg
permeability of a vacuum μ_0	$4\pi \times 10^{-7}$	$H\ m^{-1}$
permittivity of a vacuum ε_0	$8.854\ 187\ 817 \times 10^{-12}$	$F\ m^{-1}$
Planck constant h	$6.626\ 075\ 5 \times 10^{-34}$	J s
proton rest mass m_p	$1.672\ 623\ 1 \times 10^{-27}$	kg
Stefan–Boltzmann constant σ	$5.670\ 51 \times 10^{-8}$	$W\ m^{-2}\ K^{-4}$
unified atomic mass constant u	$1.660\ 540\ 2 \times 10^{-27}$	kg

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B FORMULAE AND RELATIONSHIPS

Refer to Section A for the identities of most symbols in the formulae and relationships in Section B. See brackets below the formulae for other symbols.

1 Motion and forces

linear momentum $p = mv$

final speed $v_1 = v_0 + at$

final speed $v_1^2 = v_0^2 + 2ax$

4 Fields and potential

a) All fields:

field strength $E = -dV/dr \approx -\Delta V/\Delta r$

b) Electrical:

electric field $E = F/Q$

uniform field between parallel plates $E = V/d$, $E = \sigma/\varepsilon$

capacitance of parallel plate capacitor $C = \varepsilon_0\varepsilon_1 A/d$
(ε_r = relative permittivity)

for point charges $F = \frac{1}{4\pi\varepsilon_0}\frac{Q_1Q_2}{r^2}$

d'après Advanced Physics for You, publié par Nelson Thornes, UK

5. The speed v of ocean waves in deep water is given by the relationship

$$v = \sqrt{\frac{g\lambda}{2\pi}}$$

where g is the gravitational field strength and λ is the wavelength of the waves.

a) Derive an expression for the period T of the