Muutokset verrattuna lääketieteellisten alojen v. 2024 valintakokeen kaavaliitteeseen on merkitty punaisella värillä.
Ändringarna jämfört med formelbilagan till det medicinska utbildningsområdets urvalsprov 2024 har markerats med röd färg.

KAAVALIITE / FORMELBILAGA

Vakioita / Konstanter

$N_A = 6{,}022\,140\,76 \cdot 10^{23}$ 1/mol
$G = 6{,}674 \cdot 10^{-11}$ Nm²/kg²
$e = 1{,}602\,176\,634 \cdot 10^{-19}$ C
$F = 96\,485$ C/mol
$g = 9{,}81$ m/s²
$h = 6{,}626\,070\,15 \cdot 10^{-34}$ J · s
$h = 4{,}135\,7 \cdot 10^{-15}$ eV · s
$\sigma = 5{,}670 \cdot 10^{-8}$ W/(m² · K⁴)
$b = 2{,}897\,771\,955 \cdot 10^{-3}$ m · K
$\varepsilon_0 = 8{,}85 \cdot 10^{-12}$ F/m
$\mu_0 \approx 4\pi \cdot 10^{-7}$ Vs/(Am) ≈ $1{,}257 \cdot 10^{-6}$ Vs/(Am)
$c = 299\,792\,458$ m/s
$c_a = 343$ m/s
$R_H = 1{,}096\,8 \cdot 10^{7}$ m⁻¹
$c(H_2O) = 4{,}19$ kJ/(kg · K)
$K_w = 1{,}008 \cdot 10^{-14}$ (mol/l)²

$I_0 = 10^{-12}$ W/m²
$R = 8{,}314\,46$ (Pa · m³) / (mol · K)
$= 0{,}083\,1446$ (bar · dm³) / (mol · K)
e ≈ 2,718 28
π ≈ 3,1416

protoni/proton: $m_p = 1{,}672\,621\,6 \cdot 10^{-27}$ kg
$= 1{,}007\,276\,5$ u
neutroni/neutron: $m_n = 1{,}674\,927\,3 \cdot 10^{-27}$ kg
$= 1{,}008\,665\,0$ u
elektroni/elektron: $m_e = 9{,}109\,382\,2 \cdot 10^{-31}$ kg
$= 5{,}485\,799\,1 \cdot 10^{-4}$ u

$u = 931{,}49$ MeV/c²
$= 1{,}660\,538\,9 \cdot 10^{-27}$ kg

Kaavoja ja muuntokertoimia / Formler och omvandlingsfaktorer

0 °C = 273,15 K
1 atm = 101 325 Pa
1 eV ≈ $1{,}602 \cdot 10^{-19}$ J

1 kWh = 3,6 MJ
360° = 2π rad
ln 2 ≈ 0,693

$A = 4\pi r^2;\ V = \frac{4}{3}\pi r^3$

$ax^2 + bx + c = 0 \Rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$\cos x = \sin(90° - x), 0 \le x \le 90°$

$\cos^2 x + \sin^2 x = 1$

Kemia / Kemi

$It = nzF$

$pV = nRT$

$K_a = \frac{[A^-][H_3O^+]}{[HA]}$

$pH = pK_a + \lg\frac{[A^-]}{[HA]}$

Fysiikka / Fysik

$v = v_0 + at$

$x = x_0 + v_0 t + \frac{1}{2}at^2$

$v = \omega r$

$T = \frac{2\pi}{\omega};\ f_n = \frac{n}{t} = \frac{1}{T}$

$\omega = \omega_0 + \alpha t$

$\varphi = \varphi_0 + \omega_0 t + \frac{1}{2}\alpha t^2$

$a = \frac{v^2}{r}$

$F = G\frac{m_1 m_2}{r^2}, E_p = -\frac{Gm_1 m_2}{r}$

$F = -kx;\ \frac{F}{A} = E\frac{\Delta l}{l}$

$$T = 2\pi\sqrt{\frac{m}{k}} = 2\pi\sqrt{\frac{l}{g}}$$

$$E_{\text{pot}} = \frac{1}{2}kx^2$$

$$\bar{p} = m\bar{v}$$

$$\Delta\bar{p} = \bar{I} = \bar{F}\Delta t$$

$$W = F\Delta x\cos\alpha$$

$$l = l_0(1 + \alpha\Delta T);\ V = V_0(1 + \gamma\Delta T)$$

$$\eta = \frac{W_{\text{o}}}{W_{\text{i}}} = \frac{\frac{W_{\text{o}}}{t}}{\frac{W_{\text{i}}}{t}} = \frac{P_{\text{o}}}{P_{\text{i}}}$$

$$\Delta Q = cm\Delta T$$

$$Q = sm$$

$$Q = rm$$

$$\mu_{\max} = 1 - \frac{T_2}{T_1}$$

$$S = \sigma T^4$$

$$\lambda_{\max}T = b$$

$$F = \frac{Q_1 Q_2}{4\pi\varepsilon_0 r^2}$$

$$F = qE$$

$$V(x_0) = E_0/q$$

$$E_{\text{pot}} = qU$$

$$E = \frac{U}{d}$$

$$C = Q/U$$

$$C = \varepsilon_r\varepsilon_0\frac{A}{d}$$

$$E = \frac{1}{2}QU$$

$$U = RI,\ \ P = UI,\ \ R = \rho\frac{l}{A}$$

$$E = hf = \frac{hc}{\lambda};\ E(\text{eV}) = 1240/\lambda(\text{nm})$$

$$F_\mu = \mu N$$

$$P = W/t$$

$$E_p = mgh;\ E_k = \frac{1}{2}mv^2$$

$$\overline{M} = \overline{r} \times \overline{F}$$

$$p = \frac{F}{A} = \frac{Fs}{As} = \frac{W}{V}$$

$$p = \rho gh$$

$$f = f_0\frac{v}{v \pm v_{\text{l}}};\ f = f_0\frac{v \pm v_{\text{h}}}{v}$$

$$I = \frac{P}{A},\ \frac{I_1}{I_2} = \frac{r_2^2}{r_1^2}$$

$$L = 10\lg\left(\frac{I}{I_0}\right)\text{dB}$$

$$\frac{\sin\alpha_1}{\sin\alpha_2} = \frac{\lambda_1}{\lambda_2} = \frac{v_1}{v_2} = \frac{n_2}{n_1} = n_{12}$$

$$L = I/A$$

$$\frac{v_1}{v_2} = \sqrt{\frac{T_1}{T_2}}$$

$$\Delta Q = I \cdot \Delta t$$

$$B = \frac{\mu_0 I}{2\pi r}$$

$$\bar{F} = q(\bar{v} \times \bar{B});\ F = qvB\sin\alpha$$

$$F_m = IlB\sin\alpha$$

$$e = lvB\sin\alpha$$

$$\Phi = AB\cos\alpha$$

$$e = NAB\,\omega\sin(\omega t)$$

$$e_k = -\frac{\Delta\Phi}{\Delta t}$$

$$M = NABI\sin\alpha$$

$$\frac{U_1}{U_2} = \frac{N_1}{N_2} \approx \frac{I_2}{I_1}$$

$$I = I_0\mathrm{e}^{-\mu x}$$

$$\lambda = \frac{h}{p} = \frac{h}{mv}$$

$$2d \sin\theta = n\lambda$$

$$\frac{1}{\lambda} = R_{\mathrm{H}}\left(\frac{1}{n^2} - \frac{1}{m^2}\right)$$

$$N = \frac{m}{M} N_{\mathrm{A}}$$

$$T_{1/2} = \frac{ln2}{\lambda}$$

$$E_k^{max} = hf - W_0$$

$$E = \sum(w_{\mathrm{T}} H_{\mathrm{T}})$$

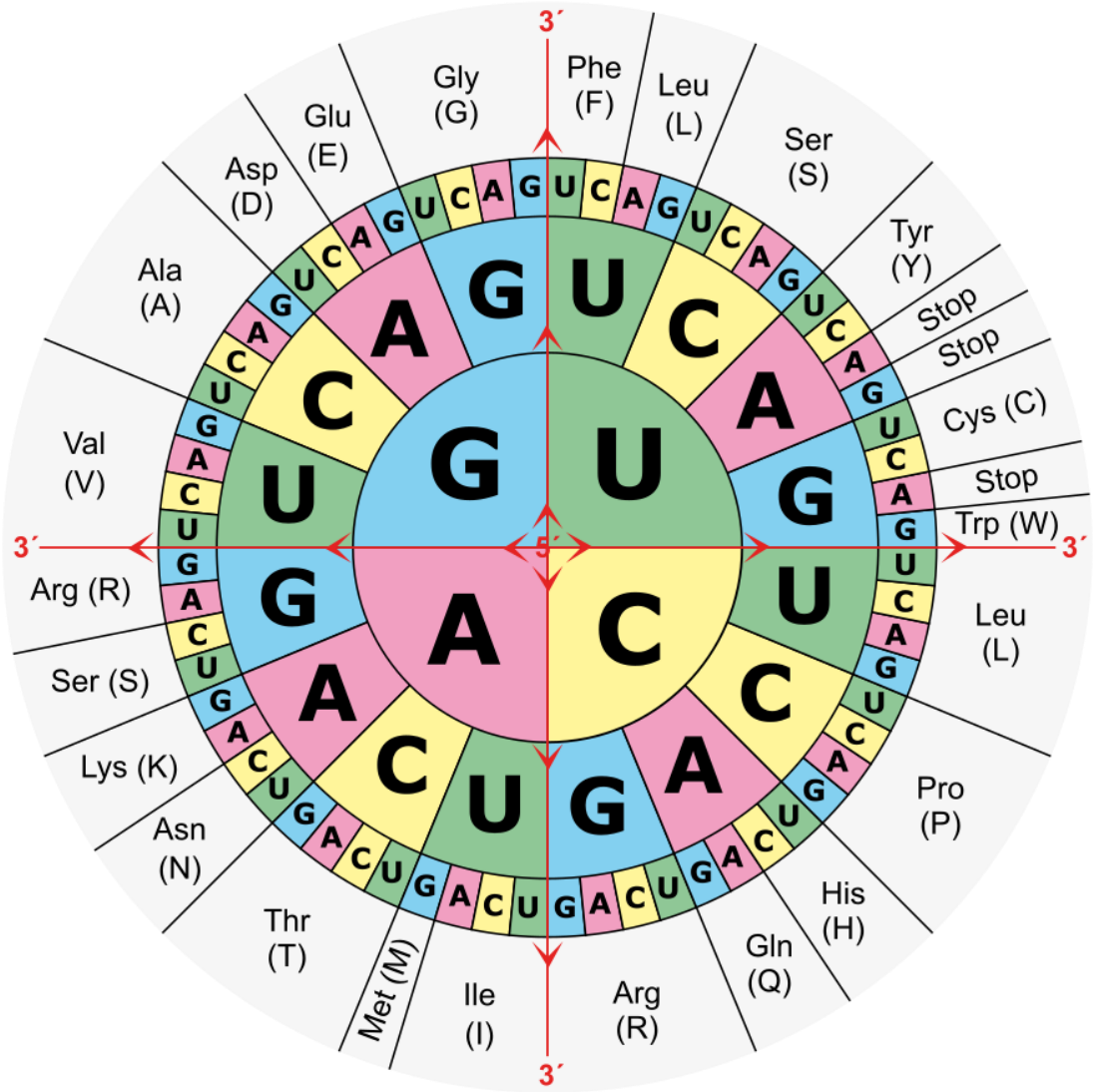
$$E = \frac{\Phi}{A}$$

$$\Delta E_k = W = QU$$

$$A = \lambda N = \lambda N_0 \mathrm{e}^{-\lambda t} = A_0 \mathrm{e}^{-\lambda t}$$

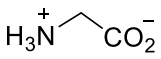
$$H_{\mathrm{T}} = w_R D$$

Lähetti-RNA:n kodoneja vastaavat aminohapot
Aminosyror som motsvarar kodon i budbärar-RNA

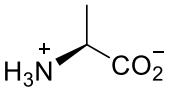


Luonnon aminohapot / Aminosyrorna i naturen

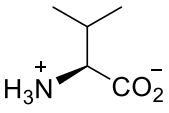
Aminohapot on esitetty siinä muodossa, jossa ne pääosin esiintyvät fysiologisessa pH-arvossa 7,4.
Aminosyrorna presenteras i den form som mest förekommer vid det fysiologiska pH-värdet 7,4.



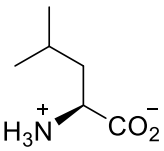
glysiini / glycin
Gly, G



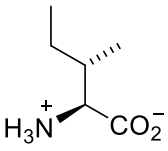
alaniini / alanin
Ala, A



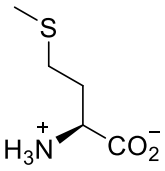
valiini / valin
Val, V



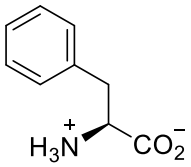
leusiini / leucin
Leu, L



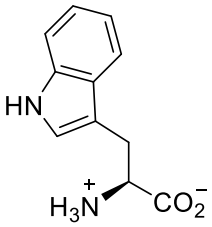
isoleusiini / isoleucin
Ile, I



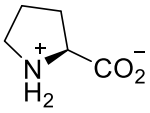
metioniini / metionin
Met, M



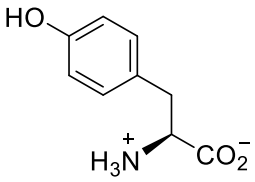
fenyylialaniini / fenylalanin
Phe, F



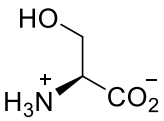
tryptofaani / tryptofan
Trp, W



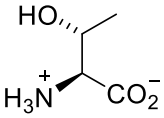
proliini / prolin
Pro, P



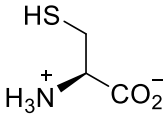
tyrosiini / tyrosin
Tyr, Y



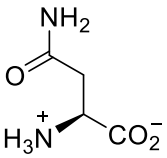
seriini / serin
Ser, S



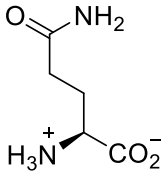
treoniini / treonin
Thr, T



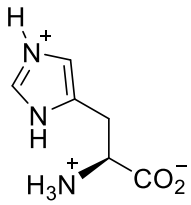
kysteiini / cystein
Cys, C



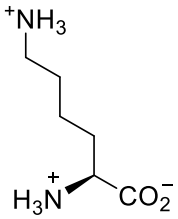
asparagiini / asparagin
Asn, N



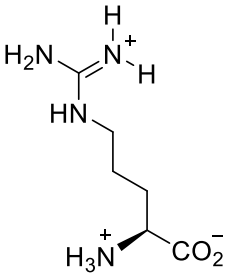
glutamiini / glutamin
Gln, Q



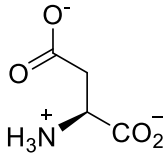
histidiini / histidin
His, H



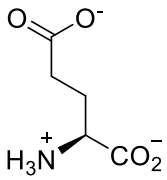
lysiini / lysin
Lys, K



arginiini / arginin
Arg, R



asparagiinihappo / asparaginsyra
Asp, D



glutamiinihappo / glutaminsyra
Glu, E

Alkuaineiden jaksollinen järjestelmä / Grundämnenas periodiska system

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	$_{1}$**H** 1,008																	$_{2}$**He** 4,003
2	$_{3}$**Li** 6,941	$_{4}$**Be** 9,012											$_{5}$**B** 10,81	$_{6}$**C** 12,01	$_{7}$**N** 14,01	$_{8}$**O** 16,00	$_{9}$**F** 19,00	$_{10}$**Ne** 20,18
3	$_{11}$**Na** 22,99	$_{12}$**Mg** 24,31											$_{13}$**Al** 26,98	$_{14}$**Si** 28,09	$_{15}$**P** 30,97	$_{16}$**S** 32,07	$_{17}$**Cl** 35,45	$_{18}$**Ar** 39,95
4	$_{19}$**K** 39,10	$_{20}$**Ca** 40,08	$_{21}$**Sc** 44,96	$_{22}$**Ti** 47,87	$_{23}$**V** 50,94	$_{24}$**Cr** 52,00	$_{25}$**Mn** 54,94	$_{26}$**Fe** 55,85	$_{27}$**Co** 58,93	$_{28}$**Ni** 58,69	$_{29}$**Cu** 63,55	$_{30}$**Zn** 65,38	$_{31}$**Ga** 69,72	$_{32}$**Ge** 72,63	$_{33}$**As** 74,92	$_{34}$**Se** 78,96	$_{35}$**Br** 79,90	$_{36}$**Kr** 83,80
5	$_{37}$**Rb** 85,47	$_{38}$**Sr** 87,62	$_{39}$**Y** 88,91	$_{40}$**Zr** 91,22	$_{41}$**Nb** 92,91	$_{42}$**Mo** 95,96	$_{43}$**Tc** (98)	$_{44}$**Ru** 101,07	$_{45}$**Rh** 102,91	$_{46}$**Pd** 106,42	$_{47}$**Ag** 107,87	$_{48}$**Cd** 112,41	$_{49}$**In** 114,82	$_{50}$**Sn** 118,71	$_{51}$**Sb** 121,76	$_{52}$**Te** 127,60	$_{53}$**I** 126,90	$_{54}$**Xe** 131,29
6	$_{55}$**Cs** 132,91	$_{56}$**Ba** 137,33	57 - 71	$_{72}$**Hf** 178,49	$_{73}$**Ta** 180,95	$_{74}$**W** 183,84	$_{75}$**Re** 186,21	$_{76}$**Os** 190,23	$_{77}$**Ir** 192,22	$_{78}$**Pt** 195,08	$_{79}$**Au** 196,97	$_{80}$**Hg** 200,59	$_{81}$**Tl** 204,38	$_{82}$**Pb** 207,2	$_{83}$**Bi** 208,98	$_{84}$**Po** (209)	$_{85}$**At** (210)	$_{86}$**Rn** (222)
7	$_{87}$**Fr** (223)	$_{88}$**Ra** (226)	89 - 103	$_{104}$**Rf** (261)	$_{105}$**Db** (262)	$_{106}$**Sg** (266)	$_{107}$**Bh** (264)	$_{108}$**Hs** (277)	$_{109}$**Mt** (268)	$_{110}$**Ds** (281)	$_{111}$**Rg** (272)	$_{112}$**Cn** (285)	$_{113}$**Nh** (286)	$_{114}$**Fl** (289)	$_{115}$**Mc** (288)	$_{116}$**Lv** (293)	$_{117}$**Ts** (294)	$_{118}$**Og** (294)

(57 - 71):	$_{57}$**La** 138,91	$_{58}$**Ce** 140,12	$_{59}$**Pr** 140,91	$_{60}$**Nd** 144,24	$_{61}$**Pm** (145)	$_{62}$**Sm** 150,36	$_{63}$**Eu** 151,96	$_{64}$**Gd** 157,25	$_{65}$**Tb** 158,93	$_{66}$**Dy** 162,50	$_{67}$**Ho** 164,93	$_{68}$**Er** 167,26	$_{69}$**Tm** 168,93	$_{70}$**Yb** 173,05	$_{71}$**Lu** 174,97
(89 - 103):	$_{89}$**Ac** (227)	$_{90}$**Th** 232,04	$_{91}$**Pa** 231,04	$_{92}$**U** 238,03	$_{93}$**Np** (237)	$_{94}$**Pu** (244)	$_{95}$**Am** (243)	$_{96}$**Cm** (247)	$_{97}$**Bk** (247)	$_{98}$**Cf** (251)	$_{99}$**Es** (252)	$_{100}$**Fm** (257)	$_{101}$**Md** (258)	$_{102}$**No** (259)	$_{103}$**Lr** (262)