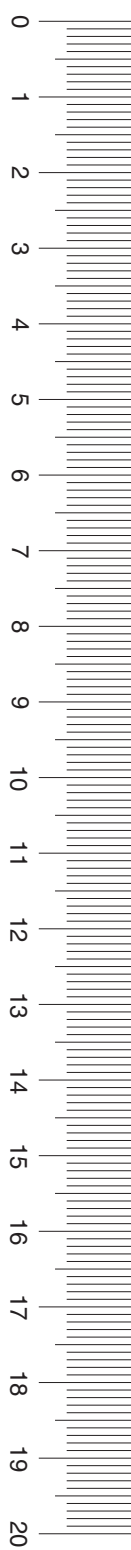


FORMULA CHART

for Grade 11 Science Assessment

Centimeters



Density = $\frac{\text{mass}}{\text{volume}}$	$D = \frac{m}{v}$
$\left(\begin{array}{l} \text{heat gained or} \\ \text{lost by water} \end{array} \right) = \left(\begin{array}{l} \text{mass in} \\ \text{grams} \end{array} \right) \left(\begin{array}{l} \text{change in} \\ \text{temperature} \end{array} \right) \left(\begin{array}{l} \text{specific} \\ \text{heat} \end{array} \right)$	$Q = (m)(\Delta T)(C_p)$
Speed = $\frac{\text{distance}}{\text{time}}$	$s = \frac{d}{t}$
Acceleration = $\frac{\text{final velocity} - \text{initial velocity}}{\text{change in time}}$	$a = \frac{v_f - v_i}{\Delta t}$
Momentum = mass \times velocity	$p = mv$
Force = mass \times acceleration	$F = ma$
Work = force \times distance	$W = Fd$
Power = $\frac{\text{work}}{\text{time}}$	$P = \frac{W}{t}$
% efficiency = $\frac{\text{work output}}{\text{work input}} \times 100$	$\% = \frac{W_o}{W_i} \times 100$
Kinetic energy = $\frac{1}{2} (\text{mass} \times \text{velocity}^2)$	$KE = \frac{mv^2}{2}$
Gravitational potential energy = mass \times acceleration due to gravity \times height	$GPE = mgh$
Energy = mass \times (speed of light) ²	$E = mc^2$
Velocity of a wave = frequency \times wavelength	$v = f\lambda$
Current = $\frac{\text{voltage}}{\text{resistance}}$	$I = \frac{V}{R}$
Electrical power = voltage \times current	$P = VI$
Electrical energy = power \times time	$E = Pt$

Constants/Conversions		
$g = \text{acceleration due to gravity} = 9.8 \text{ m/s}^2$		
$c = \text{speed of light} = 3 \times 10^8 \text{ m/s}$		
speed of sound = 343 m/s at 20°C		
$1 \text{ cm}^3 = 1 \text{ mL}$		
1 wave/second = 1 hertz (Hz)		
1 calorie (cal) = 4.18 joules		
1000 calories (cal) = 1 Calorie (Cal) = 1 kilocalorie (kcal)		
newton (N) = kgm/s^2		
joule (J) = Nm		
watt (W) = J/s = Nm/s		
volt (V)	ampere (A)	ohm (Ω)

Periodic Table of the Elements

Atomic number — 14
 Symbol — **Si**
 Atomic mass — 28.086
 Silicon — Name

Group	1	2											16	17	18								
	IA	IIA	3			4			5			6			VIIA	VIIIA							
			IIIB	IVB	VB	VIB	VII B	VIII	IX	X	11		12		IIIA	IVA	VA	VIA	VIIA				
											IB	IIB											
1	1 H 1.008 Hydrogen	2 He 4.0026 Helium											16 O 15.999 Oxygen	17 F 18.998 Fluorine	18 Ne 20.179 Neon								
2	3 Li 6.941 Lithium	4 Be 9.012 Beryllium											13 B 10.81 Boron	14 C 12.011 Carbon	15 N 14.007 Nitrogen	16 O 15.999 Oxygen	17 F 18.998 Fluorine	18 Ne 20.179 Neon					
3	11 Na 22.990 Sodium	12 Mg 24.305 Magnesium	3			4			5			6			13 Al 26.982 Aluminum	14 Si 28.086 Silicon	15 P 30.974 Phosphorus	16 S 32.066 Sulfur	17 Cl 35.453 Chlorine	18 Ar 39.948 Argon			
4	19 K 39.098 Potassium	20 Ca 40.08 Calcium	3			4			5			6			31 Ga 69.72 Gallium	32 Ge 72.61 Germanium	33 As 74.922 Arsenic	34 Se 78.96 Selenium	35 Br 79.904 Bromine	36 Kr 83.80 Krypton			
5	37 Rb 85.468 Rubidium	38 Sr 87.62 Strontium	3			4			5			6			49 In 114.82 Indium	50 Sn 118.71 Tin	51 Sb 121.763 Antimony	52 Te 127.60 Tellurium	53 I 126.904 Iodine	54 Xe 131.29 Xenon			
6	55 Cs 132.905 Cesium	56 Ba 137.33 Barium	3			4			5			6			81 Tl 204.383 Thallium	82 Pb 207.2 Lead	83 Bi 208.980 Bismuth	84 Po (209) Polonium	85 At (210) Astatine	86 Rn (222) Radon			
7	87 Fr (223) Francium	88 Ra 226.025 Radium	3			4			5			6			110 Ds (265) Darmstadtium	111 Rg (266) Roentgenium	112 Cn (285) Copernicium	113 Nh (286) Nihonium	114 Fl (289) Flerovium	115 Mc (288) Moscovium	116 Lv (293) Livermorium	117 Ts (294) Tennessine	118 Og (294) Oganesson

Mass numbers in parentheses are those of the most stable or most common isotope.

Lanthanide Series		Actinide Series	
58 Ce 140.12 Cerium	59 Pr 140.908 Praseodymium	60 Nd 144.24 Neodymium	61 Pm (145) Promethium
62 Sm 150.36 Samarium	63 Eu 151.97 Europium	64 Gd 157.25 Gadolinium	65 Tb 158.925 Terbium
66 Dy 162.50 Dysprosium	67 Ho 164.930 Holmium	68 Er 167.26 Erbium	69 Tm 168.934 Thulium
70 Yb 173.04 Ytterbium	71 Lu 174.967 Lutetium	88 Ra 226.025 Radium	89 Ac 227.028 Actinium
90 Th 232.038 Thorium	91 Pa 231.036 Protactinium	92 U 238.029 Uranium	93 Np 237.048 Neptunium
94 Pu (244) Plutonium	95 Am (243) Americium	96 Cm (247) Curium	97 Bk (247) Berkelium
98 Cf (251) Californium	99 Es (252) Einsteinium	100 Fm (257) Fermium	101 Md (258) Mendelevium
102 No (259) Nobelium	103 Lr (262) Lawrencium	104 Rf (261) Rutherfordium	105 Db (262) Dubnium
106 Sg (263) Seaborgium	107 Bh (262) Bohrium	108 Hs (265) Hassium	109 Mt (266) Meitnerium
110 Ds (265) Darmstadtium	111 Rg (266) Roentgenium	112 Cn (285) Copernicium	113 Nh (286) Nihonium
114 Fl (289) Flerovium	115 Mc (288) Moscovium	116 Lv (293) Livermorium	117 Ts (294) Tennessine
118 Og (294) Oganesson	119 Uue (295) Ununennium	120 Uub (293) Unbibium	121 Uut (293) Untrium