



Oxford Cambridge and RSA

June 2022 only

**GCSE (9–1) Combined Science B
(Twenty First Century Science)**

J260 04/08

Data Sheet



INSTRUCTIONS

- Do **not** send this Data Sheet for marking. Keep it in the centre or recycle it.

INFORMATION

- This Data Sheet is for the June 2022 examination series only.
- This Data Sheet has **4** pages.

The Periodic Table of the Elements

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18)

Key
atomic number
Symbol
name
relative atomic mass

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18																																																							
1 H hydrogen 1.0	3 Li lithium 6.9	4 Be beryllium 9.0	11 Na sodium 23.0	12 Mg magnesium 24.3	19 K potassium 39.1	20 Ca calcium 40.1	37 Rb rubidium 85.5	55 Cs caesium 132.9	87 Fr francium	21 Sc scandium 45.0	39 Y yttrium 88.9	57-71 lanthanoids	89-103 actinoids	22 Ti titanium 47.9	40 Zr zirconium 91.2	72 Hf hafnium 178.5	104 Rf rutherfordium	110 Ds darmstadtium	23 V vanadium 50.9	41 Nb niobium 92.9	73 Ta tantalum 180.9	105 Db dubnium	24 Cr chromium 52.0	42 Mo molybdenum 95.9	74 W tungsten 183.8	106 Sg seaborgium	25 Mn manganese 54.9	43 Tc technetium	75 Re rhenium 186.2	107 Bh bohrium	26 Fe iron 55.8	44 Ru ruthenium 101.1	76 Os osmium 190.2	108 Hs hassium	27 Co cobalt 58.9	45 Rh rhodium 102.9	77 Ir iridium 192.2	109 Mt meitnerium	28 Ni nickel 58.7	46 Pd palladium 106.4	78 Pt platinum 195.1	110 Ds darmstadtium	29 Cu copper 63.5	47 Ag silver 107.9	79 Au gold 197.0	111 Rg roentgenium	30 Zn zinc 65.4	48 Cd cadmium 112.4	80 Hg mercury 200.6	112 Cn copernicium	31 Ga gallium 69.7	49 In indium 114.8	81 Tl thallium 204.4	113 Nh nihonium	32 Ge germanium 72.6	50 Sn tin 118.7	82 Pb lead 207.2	114 Fl flerovium	33 As arsenic 74.9	51 Sb antimony 121.8	83 Bi bismuth 209.0	115 Mc moscovium	34 Se selenium 79.0	52 Te tellurium 127.6	84 Po polonium	116 Lv livermorium	35 Br bromine 79.9	53 I iodine 126.9	85 At astatine	36 Kr krypton 83.8	54 Xe xenon 131.3	86 Rn radon

Equations in physics

Key:

HT = Higher Tier only

P1 Radiation and waves

wave speed = frequency \times wavelength

P2 Sustainable energy

energy transferred = power \times time

efficiency = $\frac{\text{useful energy transferred}}{\text{total energy transferred}}$

P3 Electric circuits

charge = current \times time

potential difference = current \times resistance

potential difference = $\frac{\text{work done (energy transferred)}}{\text{charge}}$

power = $\frac{\text{energy}}{\text{time}}$

energy transferred (work done) = charge flow \times potential difference

power = potential difference \times current

power = (current)² \times resistance

potential difference across primary coil \times current in primary coil =
potential difference across secondary coil \times current in secondary coil

HT force = magnetic flux density \times current \times length of conductor

P4 Explaining motion

weight = mass × gravitational field strength, g

$$\text{average speed} = \frac{\text{distance}}{\text{time}}$$

$$\text{acceleration} = \frac{\text{change in speed}}{\text{time taken}}$$

$$(\text{final speed})^2 - (\text{initial speed})^2 = 2 \times \text{acceleration} \times \text{distance}$$

HT momentum = mass × velocity

HT change in momentum = resultant force × time for which it acts

force = mass × acceleration

work done = force × distance (along the line of action of the force)

kinetic energy = 0.5 × mass × (speed)²

(in a gravity field) gravitational potential energy = mass × gravitational field strength, g × height

$$\text{power} = \frac{\text{energy transferred}}{\text{time}}$$

P6 Matter – models and explanations

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

change in internal energy = mass × specific heat capacity × change in temperature

energy to cause a change of state = mass × specific latent heat

force exerted by a spring = extension × spring constant

$$\text{energy stored in a stretched spring} = \frac{1}{2} \times \text{spring constant} \times (\text{extension})^2$$

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