



INTEGRATED SCIENCE

STAGE 3

FORMULAE AND DATA SHEET

2015

Copyright

© School Curriculum and Standards Authority, 2012

This document – apart from any third party copyright material contained in it – may be freely copied, or communicated on an intranet, for non-commercial purposes in educational institutions, provided that it is not changed and that the School Curriculum and Standards Authority is acknowledged as the copyright owner.

Copying or communication for any other purpose can be done only within the terms of the Copyright Act or with prior written permission of the Authority. Copying or communication of any third party copyright material can be done only within the terms of the Copyright Act or with permission of the copyright owners.

This document is valid for teaching and examining until 31 December 2015.

TRIM 2014/47593

Work $W = Fs$; $W = \Delta E$

Potential energy $E_p = mgh$

Kinetic energy $E_k = \frac{1}{2} mv^2$

Power $P = \frac{W}{t}$

Electrical power $P = VI = I^2R$

Efficiency $\text{efficiency} = \frac{\text{energy out}}{\text{energy in}} \times 100\%$

Percentage composition by mass for ore A_yB_z

$$\% \text{ A in ore} = \frac{y \times \text{atomic weight of A}}{(y \times \text{atomic weight of A}) + (z \times \text{atomic weight of B})} \times 100$$

$$\% \text{ B in ore} = \frac{z \times \text{atomic weight of B}}{(y \times \text{atomic weight of A}) + (z \times \text{atomic weight of B})} \times 100$$

Relevant units and definitions

Volume: Volumes are given in the units of litres (L), or millilitres (mL).

Energy change: Energy changes are given in the SI unit joule (J).

Population density: Number of an individual species living in a particular place at a particular time per unit area.

Electricity cost: Cost = rated power of appliance \times duration of use \times cost per unit of electricity.

Cost = units of electricity used \times cost per unit of electricity.

Prefixes of the metric system

Factor	Prefix	Symbol
10^{18}	exa	E
10^{15}	peta	P
10^{12}	tera	T
10^9	giga	G
10^6	mega	M
10^3	kilo	k
10^{-3}	milli	m
10^{-6}	micro	μ

Standard atomic weights of selected elements

Name	Symbol	Atomic Weight
aluminium	Al	26.98
antimony	Sb	121.76
carbon	C	12.01
copper	Cu	63.55
gold	Au	196.97
hydrogen	H	1.008
iron	Fe	55.85
lead	Pb	207.2
nickel	Ni	58.69
oxygen	O	16.00
silicon	Si	28.09
sulfur	S	32.07
titanium	Ti	47.87
zinc	Zn	65.41
zirconium	Zr	91.22