Name: ______________________________ Date: ______________ Per: ________

Table 17.9 Discovering Key Equations with Dimensional Analysis

Derived Unit	Quantity	Expressed as Fundamental Units	Complete the Equation . . .	In Terms of . . .
volt	(potential diff., *V*)	$\frac{kg \cdot m^2}{A \cdot s^3}$	*V = IR*	*current (I)* *resistance (R)*
watt	(power, *P*)	$\frac{kg \cdot m^2}{s^3}$	*P =*	*current (I)* *potential difference (V)*
watt	(power, *P*)	$\frac{kg \cdot m^2}{s^3}$	*P =*	*current (I)* *resistance (R)*
watt	(power, *P*)	$\frac{kg \cdot m^2}{s^3}$	*P =*	*work (W)* *time (t)*
joule	(energy, *E*)	$\frac{kg \cdot m^2}{s^2}$	*E =*	*force (F)* *distance (d)*
joule	(energy, *E*)	$\frac{kg \cdot m^2}{s^2}$	*E =*	*work (W)*
joule	(energy, *E*)	$\frac{kg \cdot m^2}{s^2}$	*E =*	*mass (m)* *velocity (v)*
joule	(energy, *E*)	$\frac{kg \cdot m^2}{s^2}$	*E =*	*mass (m)* *acceleration (a)* *distance (d)*
N·s	(impulse)	$\frac{kg \cdot m}{s}$	*Impulse =*	*force (F)* *time (t)*
farad	(capacitance, *C*)	$\frac{A^2 \cdot s^4}{kg \cdot m^2}$	*C =*	*potential difference (V)* *charge (Q)*
Pa	(pressure, p)	$\frac{kg}{m \cdot s^2}$	*p =*	*force (F)* *distance (d)*

APPENDIX 1.1 PHYSICAL QUANTITIES AND THEIR SI UNITS

	symbol	*SI measurement units*	*symbol*	*unit dimensions*
distance	***d***	**meter**	**m**	**m**
mass	***m***	**kilogram**	**kg**	**kg**
time	***t***	**second**	**s**	**s**
electric charge*	***Q***	**coulomb**	**C**	**C**
temperature	***T***	**Kelvin**	**K**	**K**
amount of substance	***n***	**mole**	**mol**	**mol**
luminous intensity	***I***	**candela**	**cd**	**cd**
acceleration	*a*	meter per second squared	m/s^2	m/s^2
area	*A*	square meter	m^2	m^2
capacitance	*C*	farad	F	$C^2{\cdot}s^2/kg{\cdot}m^2$
concentration	*[C]*	molar	M	mol/dm^3
density	*D*	kilogram per cubic meter	kg/m^3	kg/m^3
electric current	*I*	ampere	A	C/s
electric field intensity	*E*	newton per coulomb	N/C	$kg{\cdot}m/C{\cdot}s^2$
electric resistance	*R*	ohm	Ω	$kg{\cdot}m^2/C^2{\cdot}s$
emf	*ξ*	volt	V	$kg{\cdot}m^2/C{\cdot}s^2$
energy	*E*	joule	J	$kg{\cdot}m^2/s^2$
force	*F*	newton	N	$kg{\cdot}m/s^2$
frequency	*f*	hertz	Hz	s^{-1}
heat	*Q*	joule	J	$kg{\cdot}m^2/s^2$
illumination	*E*	lux (lumen per square meter)	lx	cd/m^2
inductance	*L*	henry	H	$kg{\cdot}m^2/C^2$
magnetic flux	*ϕ*	weber	Wb	$kg{\cdot}m^2/C{\cdot}s$
potential difference	*V*	volt	V	$kg{\cdot}m^2/C{\cdot}s^2$
power	*P*	watt	W	$kg{\cdot}m^2/s^3$
pressure	*p*	pascal (newton per square meter)	Pa	$kg/m{\cdot}s^2$
velocity	*v*	meter per second	m/s	m/s
volume	*V*	cubic meter	m^3	m^3
work	*W*	joule	J	$kg{\cdot}m^2/s^2$

* The official SI quantity is electrical current, and the base unit is the ampere. Electrical current is the