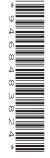


June 2022 only

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

J260 03/07

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.

Equations in physics

Key:
HT = Higher Tier only

P1 Radiation and waves

wave speed = frequency × wavelength

P2 Sustainable energy

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

P3 Electric circuits

energy transferred (work done) = charge flow × potential difference

power = potential difference × current

power = $(current)^2 \times resistance$

potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil

HT force = magnetic flux density × current × length of conductor

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P4 Explaining motion

weight = mass × gravitational field strength, g

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

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

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

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 = $0.5 \times \text{mass} \times (\text{speed})^2$

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

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

P6 Matter - models and explanations

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

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

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