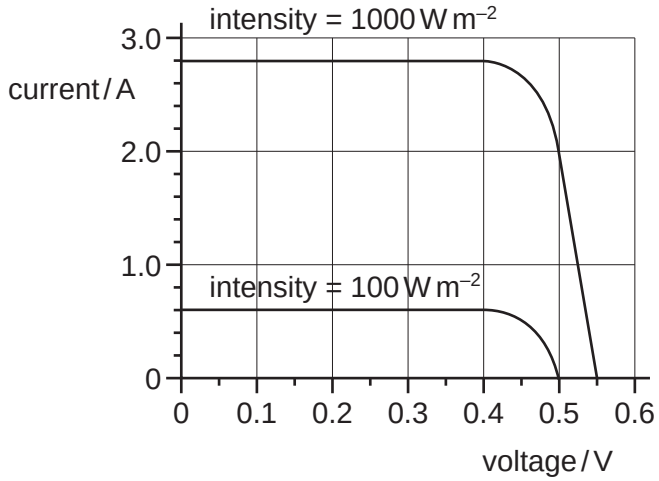
1 The drag force F acting on a moving sphere obeys an equation of the form $F = kAv^4$ where A represents the sphere's frontal area and v represents its speed.

What are the base units of the constant k?

A $\mathrm{kg\,m^5\,s^{-4}}$ **B** $\mathrm{kg\,m^{-2}\,s^{-1}}$ **C** $\mathrm{kg\,m^{-3}}$ **D** $\mathrm{kg\,m^{-4}\,s^2}$

2 The graph shows two current-voltage calibration curves for a solar cell exposed to different light intensities.



At zero voltage, what is the ratio $\dfrac{\text{current at } 1000\,\mathrm{W\,m^{-2}}}{\text{current at } 100\,\mathrm{W\,m^{-2}}}$?

A 1.1 **B** 4.7 **C** 8.0 **D** 10

Space for working