

- 11** A beam of  $\alpha$ -particles collides with a lead sheet. Each  $\alpha$ -particle in the beam has a mass of  $6.6 \times 10^{-27} \text{ kg}$  and a speed of  $1.5 \times 10^7 \text{ m s}^{-1}$ .

$5.0 \times 10^4$   $\alpha$ -particles per second collide with an area of  $1.0 \text{ cm}^2$  of lead. Almost all of the  $\alpha$ -particles are absorbed by the lead so that they have zero speed after collision.

What is an estimate of the average pressure exerted on the lead by the  $\alpha$ -particles?

**A**  $5.0 \times 10^{-15} \text{ Pa}$

**B**  $5.0 \times 10^{-13} \text{ Pa}$

**C**  $5.0 \times 10^{-11} \text{ Pa}$

**D**  $5.0 \times 10^{-9} \text{ Pa}$

- 12** An object in air is thrown upwards and towards the left