

**12** A fixed mass of an ideal gas is at a pressure of  $1.0 \times 10^5 \text{ Pa}$ . It has a temperature of  $300 \text{ K}$  and a volume of  $0.010 \text{ m}^3$ .

What is the total kinetic energy of the gas molecules after the volume is changed to  $0.0050 \text{ m}^3$  at constant temperature?

**A** 500 J

**B** 1000 J

**C** 1500 J

**D** 2000 J

**13** An airgun bullet of mass  $m$  and specific heat capacity  $c$  hits a steel plate at speed  $v$ . During the