

Solutions

Each answer shows the steps, then the **result**.

2.1

- particles are close together in a fixed, regular pattern, vibrating about fixed positions

2.2

- $p_1 V_1 = p_2 V_2$

$$p_2 = \frac{(120 \text{ kPa})(300 \text{ cm}^3)}{100 \text{ cm}^3} = \mathbf{360 \text{ kPa}}$$

3.1 B

- pressure comes from particles colliding with the walls

3.2

- (a) $p_1 V_1 = p_2 V_2$

$$(150 \text{ kPa})(400 \text{ cm}^3) = (250 \text{ kPa})V_2$$

$$V_2 = \frac{60\,000 \text{ kPa cm}^3}{250 \text{ kPa}} = \mathbf{240 \text{ cm}^3}$$

- (b) in a smaller volume the particles hit each unit of wall area more often

- so the pressure increases

3.3

- the visible specks (e.g. smoke) move in a random, jerky way
- this is because they are struck by fast, invisible air particles — showing matter is made of moving particles