

# Answer Key

1

Boyle's Law W.S.

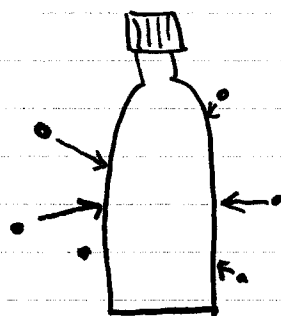
1)  $P_1 \times V_1 = P_2 \times V_2$

2) Volume will decrease. As the pressure on the outside increases it pushes in on the container, making it smaller. There are fewer collisions with a larger volume, so smaller volume leads to a higher pressure

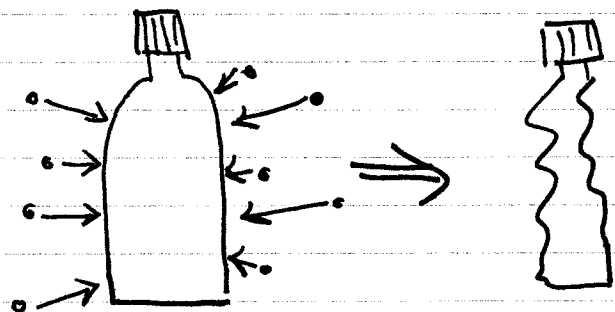
3) volume will increase (for the opposite reason as in #2)

4) As you gain altitude, the atmospheric pressure decreases. This causes the air bubble inside your ear to increase in volume. This increase in volume is what makes your ears feel plugged. When the bubble escapes from your ear they "pop."

5) It would get crushed and crinkle up



at everest.



at the beach

There is more pressure on the outside at the beach, so the volume will decrease due to the increase in pressure

6)  $P_1 = 350 \text{ torr}$        $P_2 = 700 \text{ torr}$   
 $V_1 = 200 \text{ mL}$        $V_2 = ?$

$$P_1 V_1 = P_2 V_2 \quad \frac{(350 \text{ torr})(200 \text{ mL})}{(700 \text{ torr})} = \frac{(700 \text{ torr}) V_2}{(700 \text{ torr})}$$

$$V_2 = 100 \text{ mL}$$

7)  $P_1 = ?$        $P_2 = 180 \text{ mm Hg}$   
 $V_1 = 2.4 \times 10^5 \text{ L}$        $V_2 = 1.8 \times 10^3 \text{ L}$

$$\frac{P_1 (2.4 \times 10^5 \text{ L})}{(2.4 \times 10^5 \text{ L})} = \frac{(180 \text{ mm Hg})(1.8 \times 10^3 \text{ L})}{(2.4 \times 10^5 \text{ L})}$$

$$P_1 = 1.35 \text{ mm Hg}$$

8)  $P_1 = 1.08 \text{ atm}$        $P_2 = 0.51 \text{ atm}$   
 $V_1 = 60 \text{ L}$        $V_2 = ?$

$$\frac{(1.08 \text{ atm})(60 \text{ L})}{(0.51 \text{ atm})} = \frac{(0.51 \text{ atm}) V_2}{(0.51 \text{ atm})}$$

$$V_2 = 127.1 \text{ L}$$

9)  $P_1 = 0.960 \text{ atm}$        $P_2 = ?$   
 $V_1 = 200 \text{ mL}$        $V_2 = 50 \text{ mL}$

$$\frac{(0.960 \text{ atm})(200 \text{ mL})}{(50 \text{ mL})} = \frac{P_2 (50 \text{ mL})}{(50 \text{ mL})}$$

$$P_2 = 3.84 \text{ atm}$$

10)  $P_1 = 755 \text{ mm Hg}$        $P_2 = 728 \text{ mm Hg}$   
 $V_1 = 4 \text{ L}$        $V_2 = ?$

$$\frac{(755 \text{ mm Hg})(4 \text{ L})}{(728 \text{ mm Hg})} = \frac{(728 \text{ mm Hg}) V_2}{(728 \text{ mm Hg})}$$

$$V_2 = 4.15 \text{ L}$$

\* the pressure gets lower b/c there is less air pressing down on the object