1 Gases and diffusion – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	**Write it 3 times** (English)		
gas			
pressure			
kinetic energy			
Diffusion			
concentration			
relative molecular mass			

Recall

From Part 1 you know a **gas** is far-apart, fast-moving particles. Here we see how a gas responds to **heat** and **pressure**, and how particles **spread out** by diffusion.

- Gas particles hit the container walls – this is **pressure** .
- Particles spread from crowded to spread-out places.

Nothing here is hard – it just follows the particles.

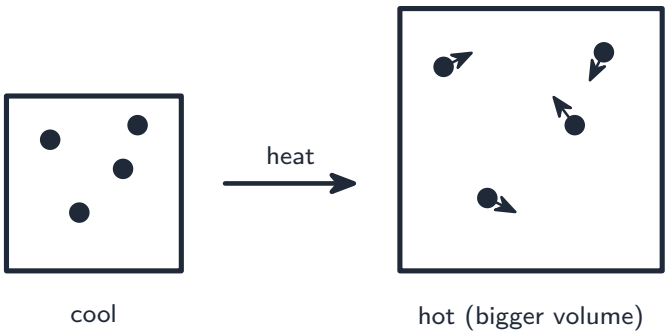
New ideas

Read these first, then do the Practice.

1 Heating a gas

Heating gives the particles more **kinetic energy** , so they move faster and hit the walls harder and more often:

- at **constant pressure** → the gas takes up **more space** (volume increases).
- at **constant volume** (a sealed rigid container) → the **pressure rises**.



2 Squeezing a gas

Increasing the **pressure** at constant temperature pushes the particles closer, so the **volume decreases**.

3 Diffusion

Diffusion is the spreading of particles from high **concentration** to low concentration, because particles move randomly. It happens in gases and liquids, not solids.

Lighter particles move faster, so a gas with a smaller **relative molecular mass** diffuses faster.

Watch out: when heating a gas, say what is fixed – in a *sealed rigid* container the pressure rises (volume fixed); at *constant pressure* the volume rises instead. In diffusion the **lighter** gas (smaller M_r) always travels faster.

Practice

Try these in order.

1.1 What causes the pressure of a gas on its container? [1]

1.2 A gas in a sealed rigid container is heated. Explain why its pressure rises. [2]

1.3 What is *diffusion*? [1]

1.4 Why does diffusion happen in gases and liquids but not in solids? [1]

1.5 Ammonia ($M_r = 17$) and hydrogen chloride ($M_r = 36.5$) diffuse from opposite ends of a tube. Which travels further, and why? [2]

1.6 Challenge. Two gases, X ($M_r = 2$) and Y ($M_r = 32$), are released together from the same place. Which spreads through the room faster, and why? [2]