



Density and pressure worksheet

Part 1 • Particles and compression

Name: _____

The air inside the balloon is a gas.

Dots are not to scale.



1 Quick recap

For each state, give its shape, volume, particle arrangement and movement.

Use these words where they fit: fixed, container's shape, fills the container, close, far apart, vibrate, move past one another, all directions.

Solid: Shape: _____ Volume: _____
Arrangement: _____ Movement: _____

Liquid: Shape: _____ Volume: _____
Arrangement: _____ Movement: _____

Gas: Shape: _____ Volume: _____
Arrangement: _____ Movement: _____

2 Same gas, less room

A closed syringe holds the same amount of gas. Its temperature stays the same as its volume decreases.

Do the particles get smaller, or do the gaps decrease? Explain.

With mass unchanged, what happens to density? Use mass divided by volume.

What happens to pressure? Explain using collisions with the container walls.



Density and pressure worksheet

Part 2 • Density and warming

Name: _____

Show your working. Include the units in each density answer.

3 Calculate density

Sample A has mass 24 g and volume 8 cm³. Write the formula, show your working and find its density in g/cm³.

Formula:

Working and density:

Sample B has mass 30 g and volume 30 cm³. Calculate its density in g/cm³.

Which sample is denser? Explain using your two answers.

4 Pressure when a gas is warmed

Compare the same amount of gas before and after warming in a sealed, rigid container. The volume stays fixed.

Why does pressure rise? Explain particle speed, collisions with the walls and force per unit area. Keep particle size and count the same.

Does the density change? Explain using mass and volume.



Density and pressure worksheet

Part 3 • Check and compare

Name: _____

Keep particle size and count the same in both models.

5 Check the model

Sam says, "When a gas is compressed, its particles get smaller."

Correct Sam's claim.

Sketch before and after compression. Keep the count and dot size the same.

Before compression

After compression

6 Compare two gas changes

Both cases start with the same amount of gas.

A: compressed to half its original volume at the same temperature.

B: warmed in a sealed, rigid container at a fixed volume.

Density in A: _____ Density in B: _____

Pressure in A: _____ Pressure in B: _____

Explain why the causes of the pressure changes differ.

Do not calculate a pressure ratio.
