B6 · Why gases behave this way: kinetic molecular theory; ideal and real gases · Notes

Goals: State the main ideas of the kinetic molecular theory. Use the theory to explain gas pressure, Boyle's law and Charles's law. Compare an ideal gas with a real gas.

Name: _____ Date: _____

Slide 1 of 5 · The kinetic molecular theory

Lessons B3 to B5 gave you laws that say what a gas does. Today you learn why a gas does it.



Key ideas

In a gas the particles are _____.

This picture of a gas is the _____.

"Kinetic" means _____.

Hotter particles move _____.

Example

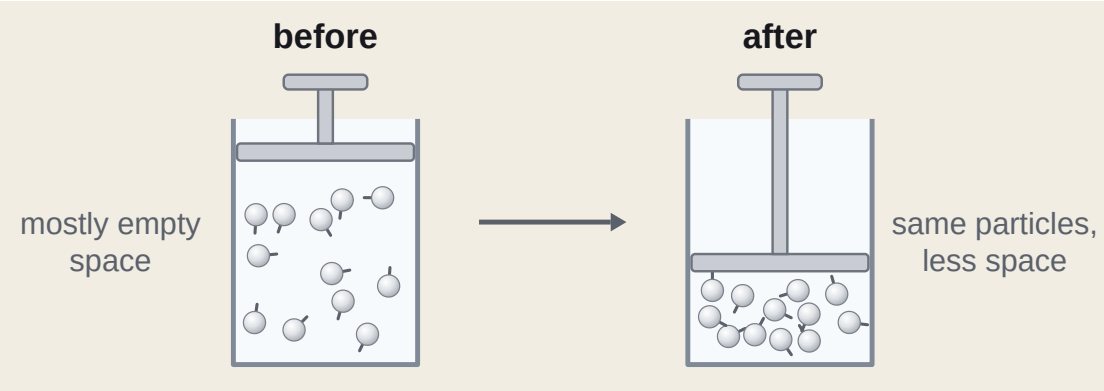
Name the three main ideas of the kinetic molecular theory.

Try it

How are the particles in a gas different from the particles in a liquid?

Slide 2 of 5 · The theory explains squeezing and pressure

The last slide gave the three ideas of the theory. A good theory explains what we see.



Key ideas

Most of a gas is _____.

A _____ has almost no empty space.

Gas particles keep hitting the _____.

These hits are the _____.

Example

Why can you squeeze a gas into a smaller space?

Try it

Which idea of the theory explains why a gas has pressure?

Slide 3 of 5 · The theory explains Boyle's law and Charles's law

The last slide used the theory to explain pressure. It also explains the gas laws from lessons B3 and B4.

Boyle's law	Charles's law
smaller space more hits each second higher pressure	hotter gas faster particles bigger volume

Key ideas

In half the space, each particle hits a wall _____.

More hits each second means more _____.

Heat a gas and its particles move _____.

If the walls can move, the volume gets _____.

Example

A gas is squeezed into half the space. Use particles to say why its pressure goes up.

Try it

A balloon is warmed. Use particles to say why it gets bigger.

Slide 4 of 5 · An ideal gas

The last slide explained two gas laws with particles. Those laws are exactly true only for an imaginary gas.

no size
of their own



no attraction
between particles

Key ideas

An _____ follows the gas laws exactly.

Its particles have no _____ of their own.

Its particles do not _____ each other at all.

Example

Name the two special features of the particles of an ideal gas.

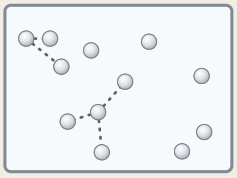
Try it

No real gas is ideal. Why do chemists still use the idea of an ideal gas?

Slide 5 of 5 · Real gases

The last slide described an ideal gas, which is imaginary. Now compare it with the gases that really exist.

some size



a little attraction
(dotted lines)

	ideal gas	real gas
particle size	none	small
attraction	none	weak
follows the gas laws	always	nearly, most of the time
turns to a liquid	never	yes, if cold enough

Key ideas

A _____ is any gas that exists.

Its particles take up a little _____.

Its particles _____ each other a little.

At very low temperature a real gas turns into a _____.

Example

Name two ways a real gas differs from an ideal gas.

Try it

When does a real gas act least like an ideal gas?