

Intro to Gases

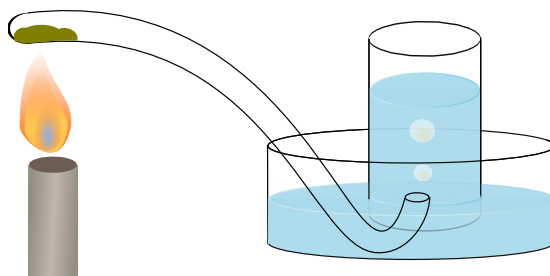
Skills to Develop

- Describe some of the history behind defining "gas"

We've described gases [before](#), so you already know that gases are a phase of matter, like liquids and solids. Like liquids, gases can flow and change shape to fit their container; unlike liquids, gases can expand or be compressed quite a lot. They will always increase in volume to fill their container, and if you squeeze them, you can force them into a small space.

The most familiar gases are probably air and steam. People have been thinking about these gases for thousands of years. In the early study of chemistry, studying gases was very important. People didn't know at first that there are different gases made of different atoms and molecules (all gases seemed like "air"). Some very early work suggested different types of gases, while other work (like Boyle's Law) suggested that all gases were the same, since they seemed to follow the same law. It was also hard to study gases at first, because they often broke the containers scientists tried to collect them in. Lavoisier calls gases "airs"; Van Helmont created the word "gas" using the Greek word for "chaos" because when he tried to collect gases as products of reactions, the containers often shattered.

Hales, a biologist, found a good way to collect gases. He filled a bottle with water, then set it upside-down in a dish of water. He put a sample of wood, sugar, seashell, etc at the closed end of a bent metal tube, and the open end into the upside-down bottle. Then he heated the closed end, so whatever gases formed went into the bottle. But Hales thought all these gases were "air", so he just measured the amount, instead of studying their properties.



Hales' system for collecting gases produced when a material is heated

A little after Hales' work, soon Black, Priestley, Cavendish and others were discovering all the different gases: carbon dioxide, nitrogen, oxygen, hydrogen, ammonia, nitrous oxide... these studies, and especially [Gay-Lussac's law](#), were important for discovering the basic facts of chemistry.

Contributors and Attributions

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