

It's a gas!



Background knowledge

Some types of matter easily change into a gas. Gasoline and perfumes are examples of this type of matter. Dry ice, which is solid, can change phase directly into a gas, but it has no odor. This property of matter is called its *volatility*. Some gases flow more rapidly than others because of differences in their density. Denser gases sink under less dense gases. Less dense gases spread out faster than denser gases. You can smell dinner cooking in the kitchen because heat from the stove changes some of the food into volatile gases, which spread through your home.

Science activity

Name of gas	Density in grams per ml
hydrogen	0.00009
carbon dioxide	0.00198
helium	0.00018
nitrogen	0.00126
oxygen	0.00143

The information in the above data tables lists the density of some common gases. The density of air is 0.0013 grams per ml. According to this data table, why do helium balloons float in air?

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Place the gases in order from least dense to densest. Which gas would flow the fastest? Explain.

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Science investigation

Do grapes float? You will need some seltzer water and grapes. Fill a glass three quarters full with seltzer water. Drop some grapes in the water and record what happens. Next, peel the skin off a few of the grapes and drop them into the seltzer water. Record what happens. Explain your observations. Make sure to include your understanding of density in your explanation.

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The density of helium is less than the density of air.

Place the gases in order from least dense to densest. Which gas would flow the fastest? Explain.

Hydrogen, helium, nitrogen, oxygen, carbon dioxide. Hydrogen... would flow the fastest since it is the least dense.

Science investigation

Unpeeled grapes will rise up in carbonated water. Their skin repels the water, so they appear to float. When the grapes are peeled, they absorb water. This increases their density, so they sink.