The Chemistry of Aromas

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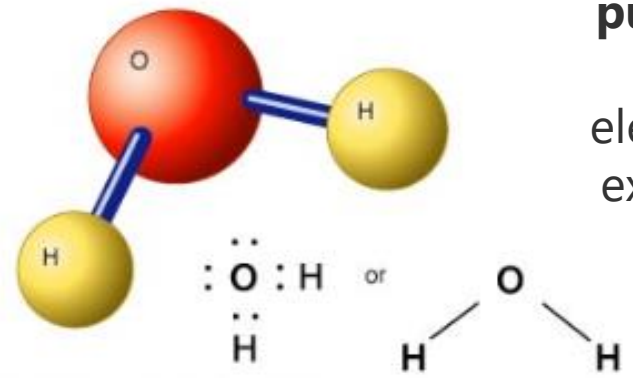
A molecule is the **smallest unit of a substance** that has all the properties of that substance. For instance, a water molecule is the smallest unit that is still water.

A water molecule can be divided into tiny parts called atoms.

This produces two hydrogen atoms and one oxygen atom.



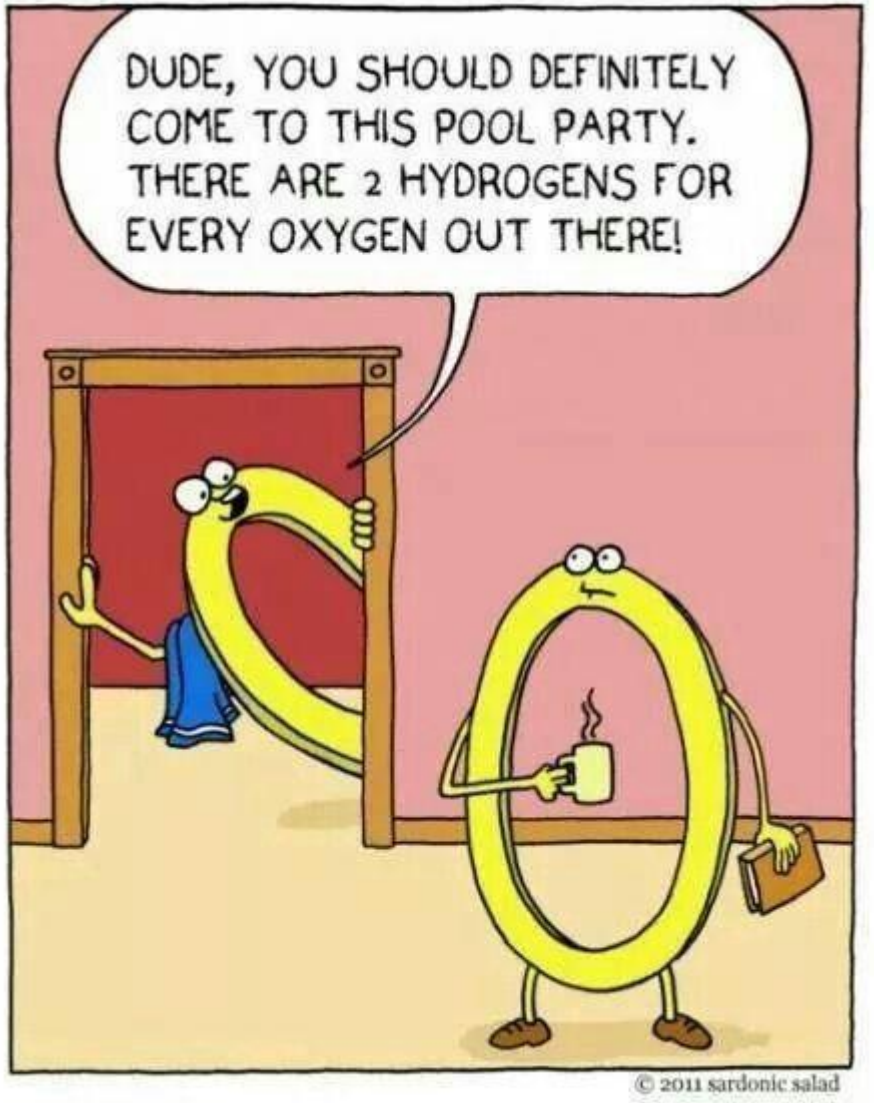
A water molecule contains two atoms of hydrogen (H) and one atom of oxygen (O). Scientists have...

Encyclopædia Britannica, Inc.

Some molecules make up the **chemical elements**.

The chemical elements are the substances of which all **matter** is made.

That is, **everything in the world is either a pure element or a combination of two or more elements.** The molecules of pure elements contain only one type of atom. For example, the molecules of the element iron consist only of iron atoms.

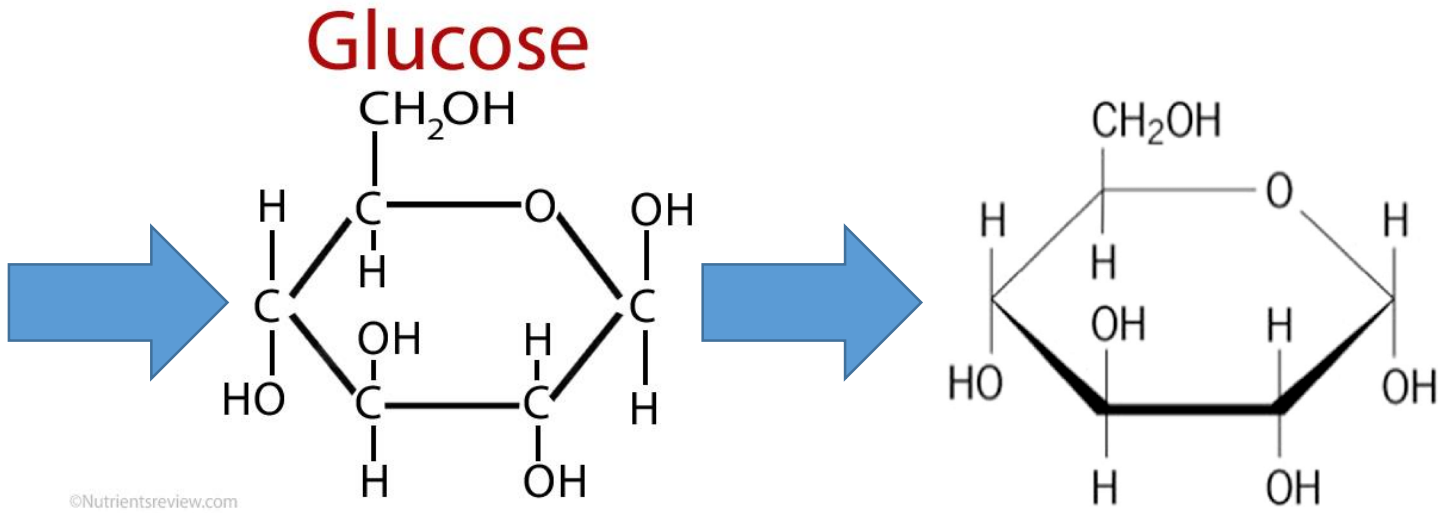


Other molecules contain atoms of two or more different elements.
A substance made of such molecules is called a chemical compound.

Water is a chemical compound because **its molecules have two hydrogen atoms and one oxygen atom**.

The **sugar called glucose** is another chemical compound. **Each glucose molecule contains 6 carbon atoms, 12 hydrogen atoms, and 6 oxygen atoms**.

Some very complex molecules in living cells are made up of hundreds of thousands of atoms….



This is how we draw molecules

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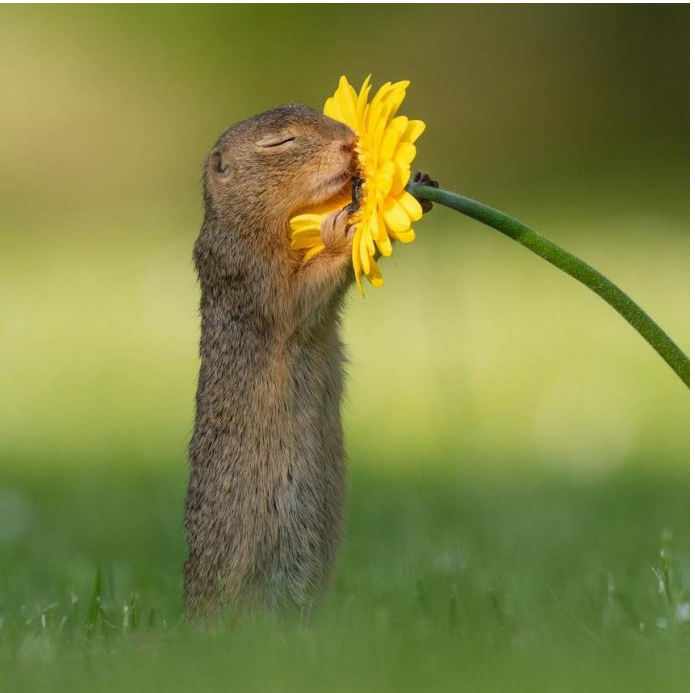
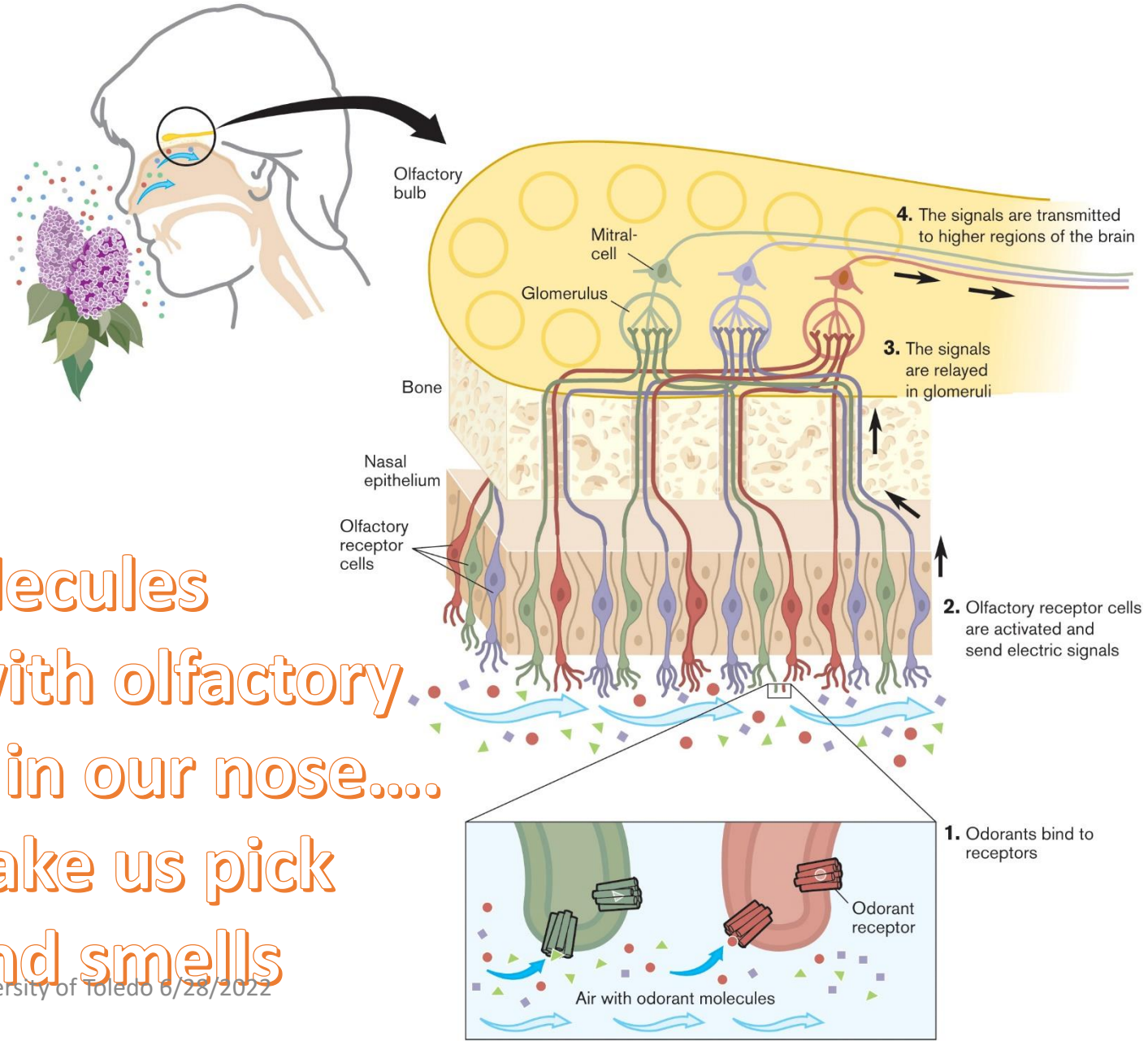
An odor is caused by one or more volatilized chemical compounds that are generally found in low concentrations that humans and animals can perceive by their sense of smell

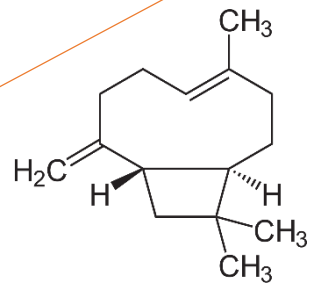


Some molecules interact with olfactory receptors in our nose….

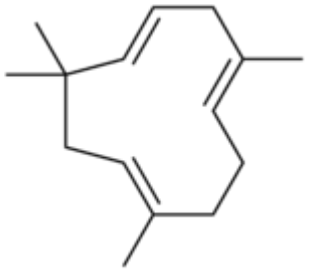
…..and make us pick aromas and smells



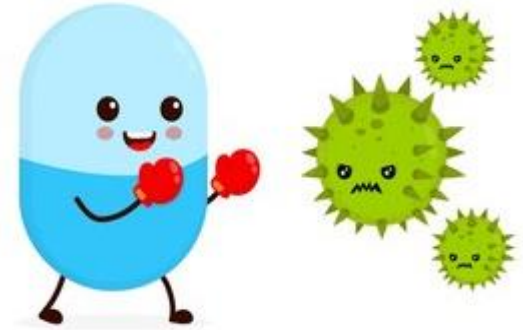
Clove oil



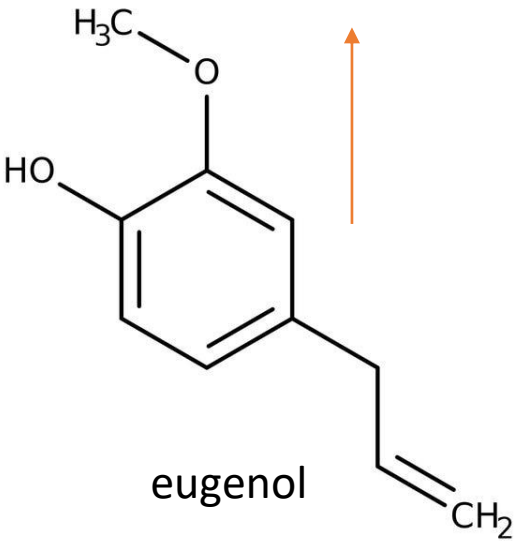
β-caryophyllene



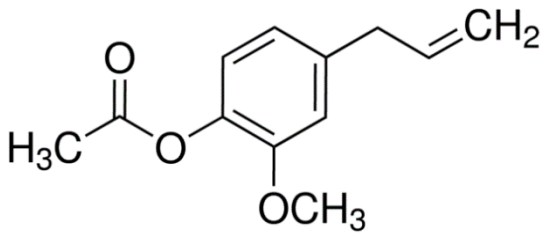
α-humulene



Antimicrobial

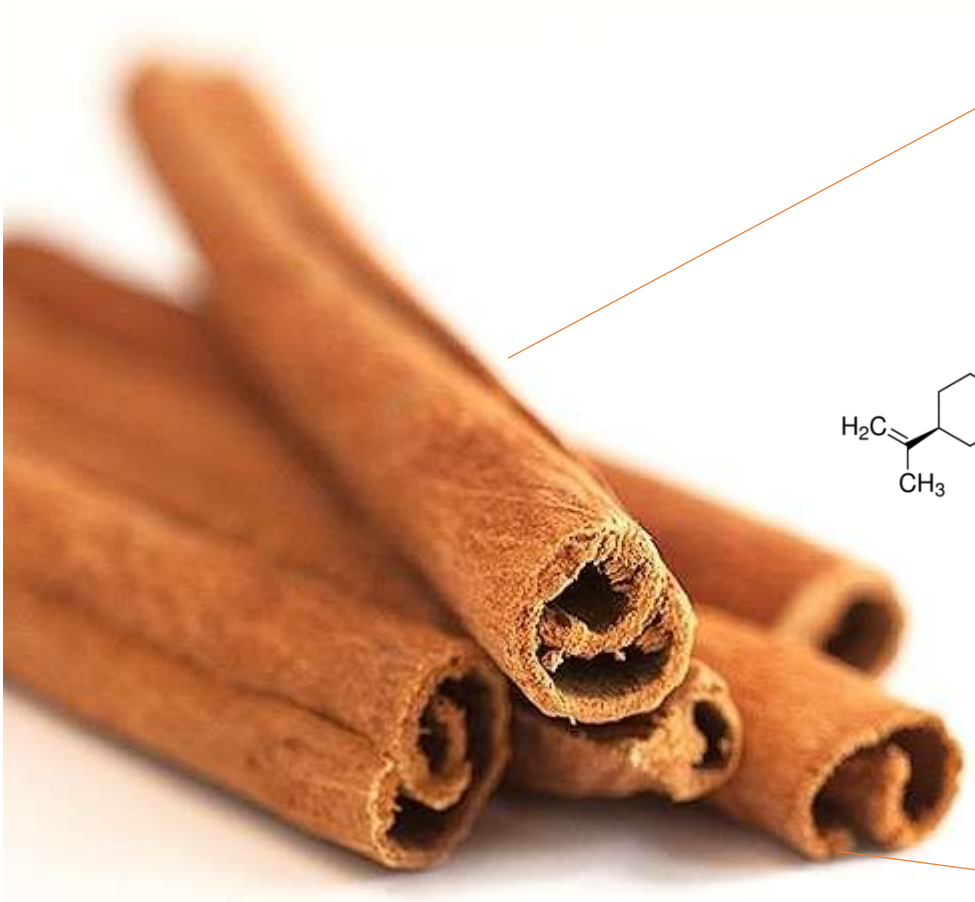


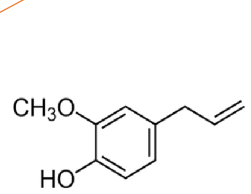
eugenol

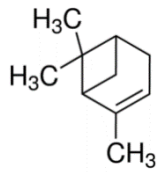


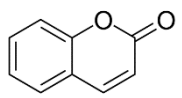
eugenyl acetate

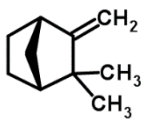
Cinnamon sticks

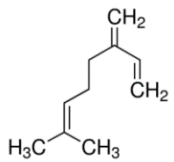


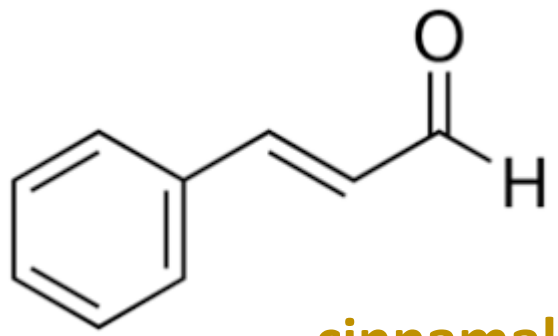












cinnamaldehyde

Why is it important to study aromas???

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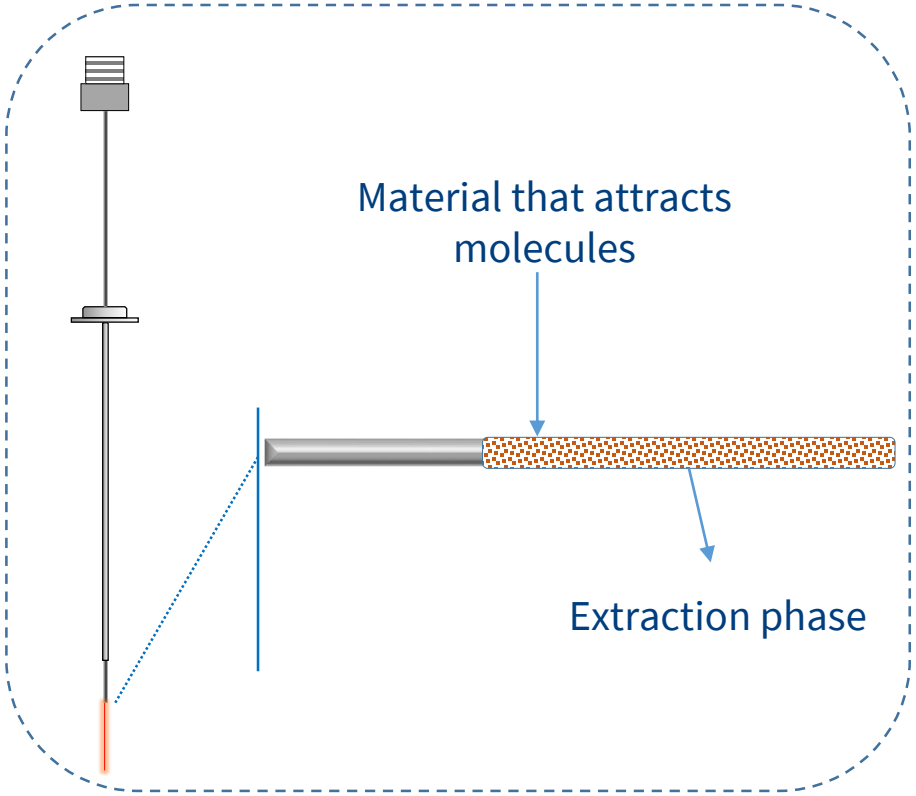
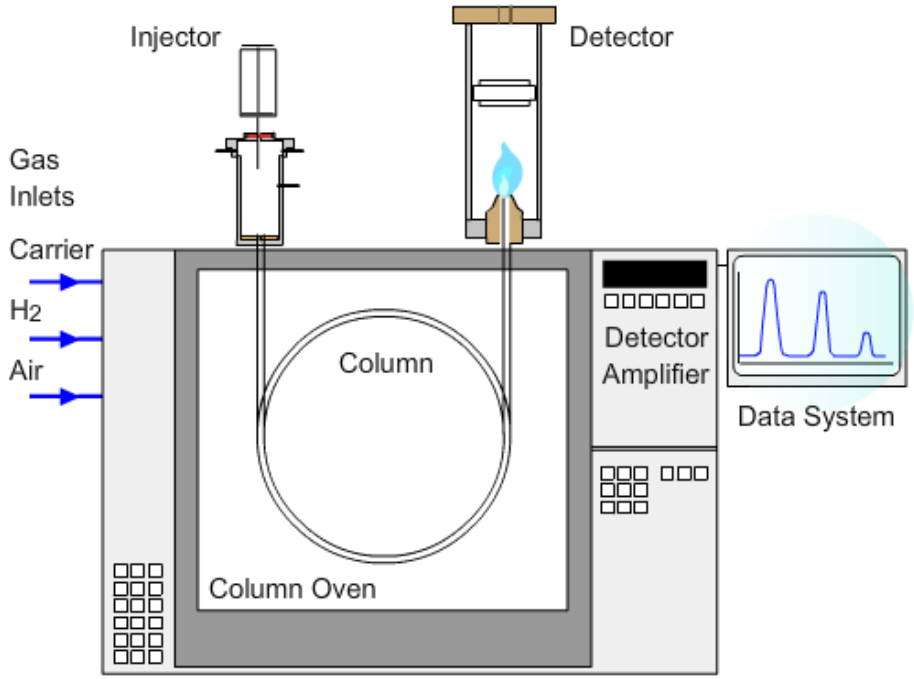
The Effects of Peppermint and Orange Aromas on Mood and Task Performance: A Research Study and Process Narration

Today's experiment

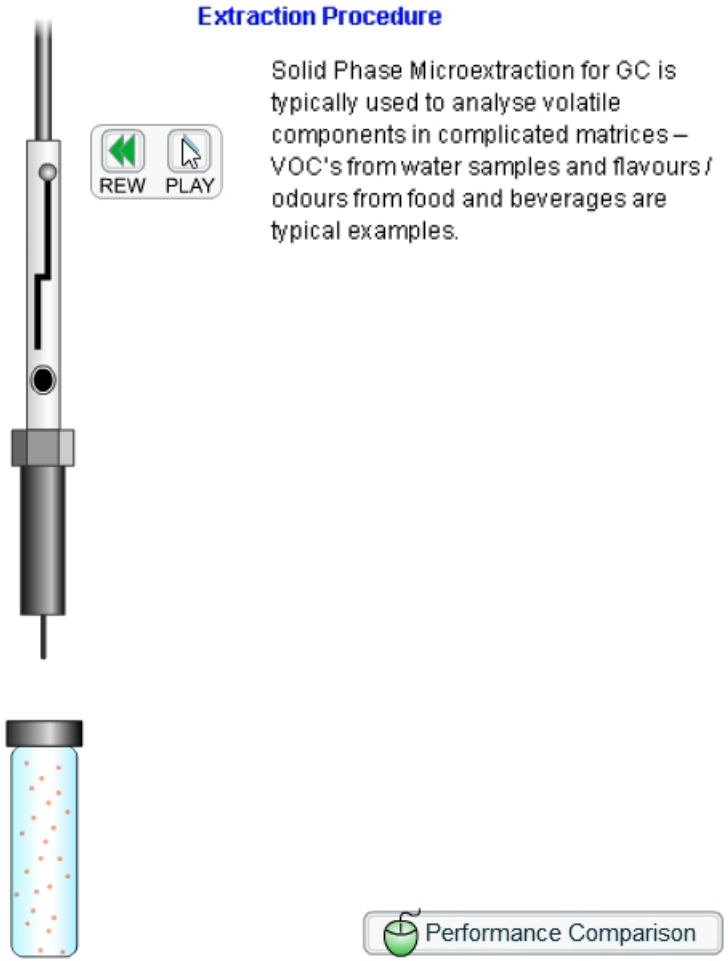
- Analyze the aroma of pine needles and cinnamon sticks by SPME-GC-MS



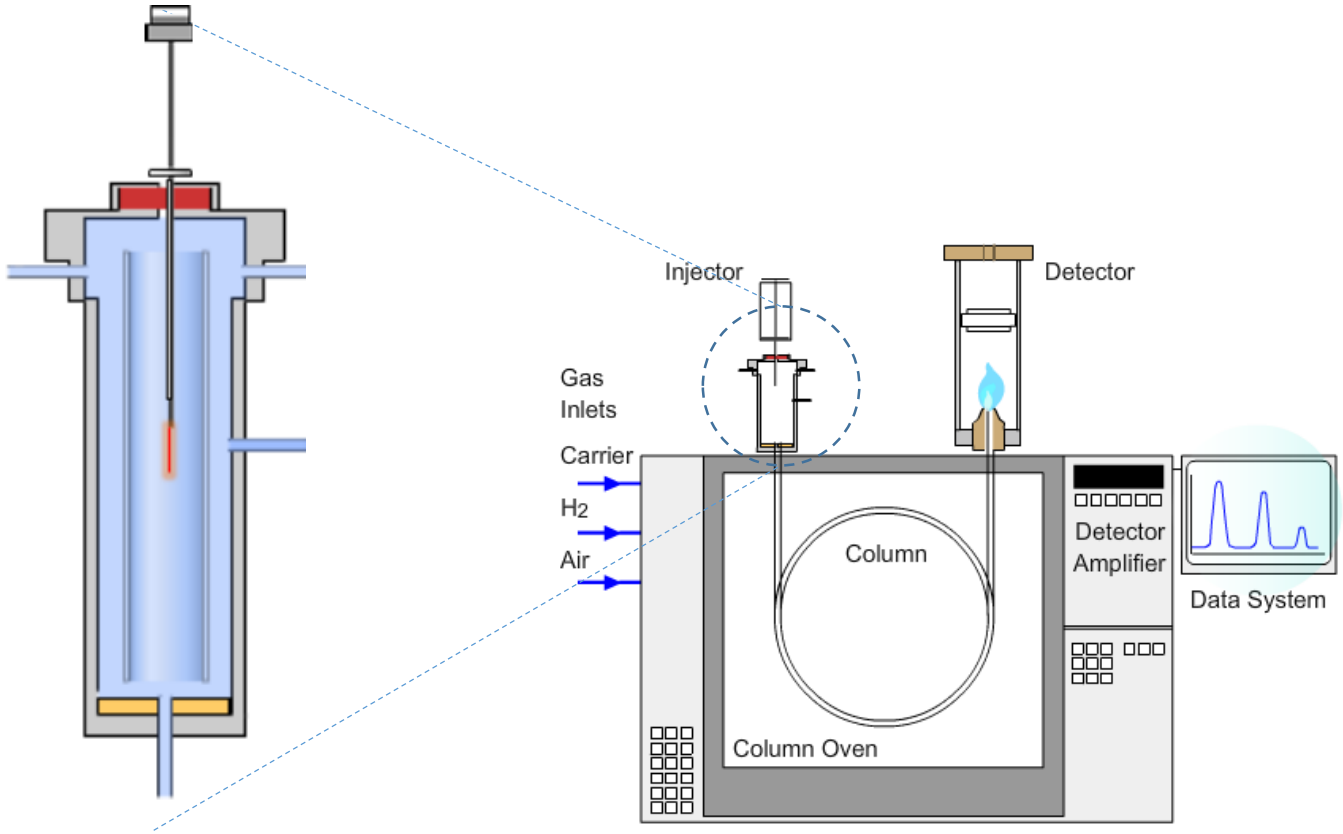
Instrument that allows us to see the molecules



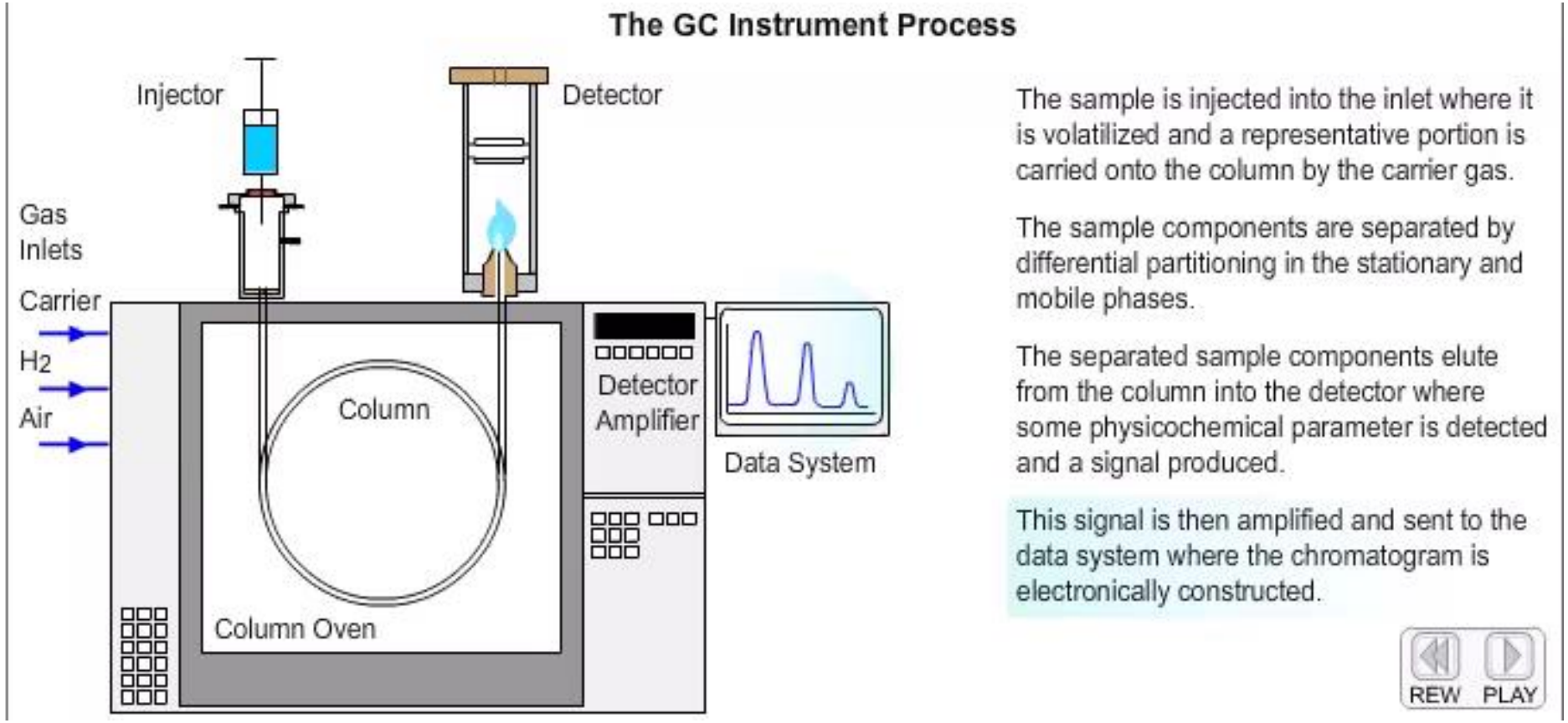
Step 1: Extraction



Step 2: Desorption



Step 3: Analysis



Let's get to work!!!

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